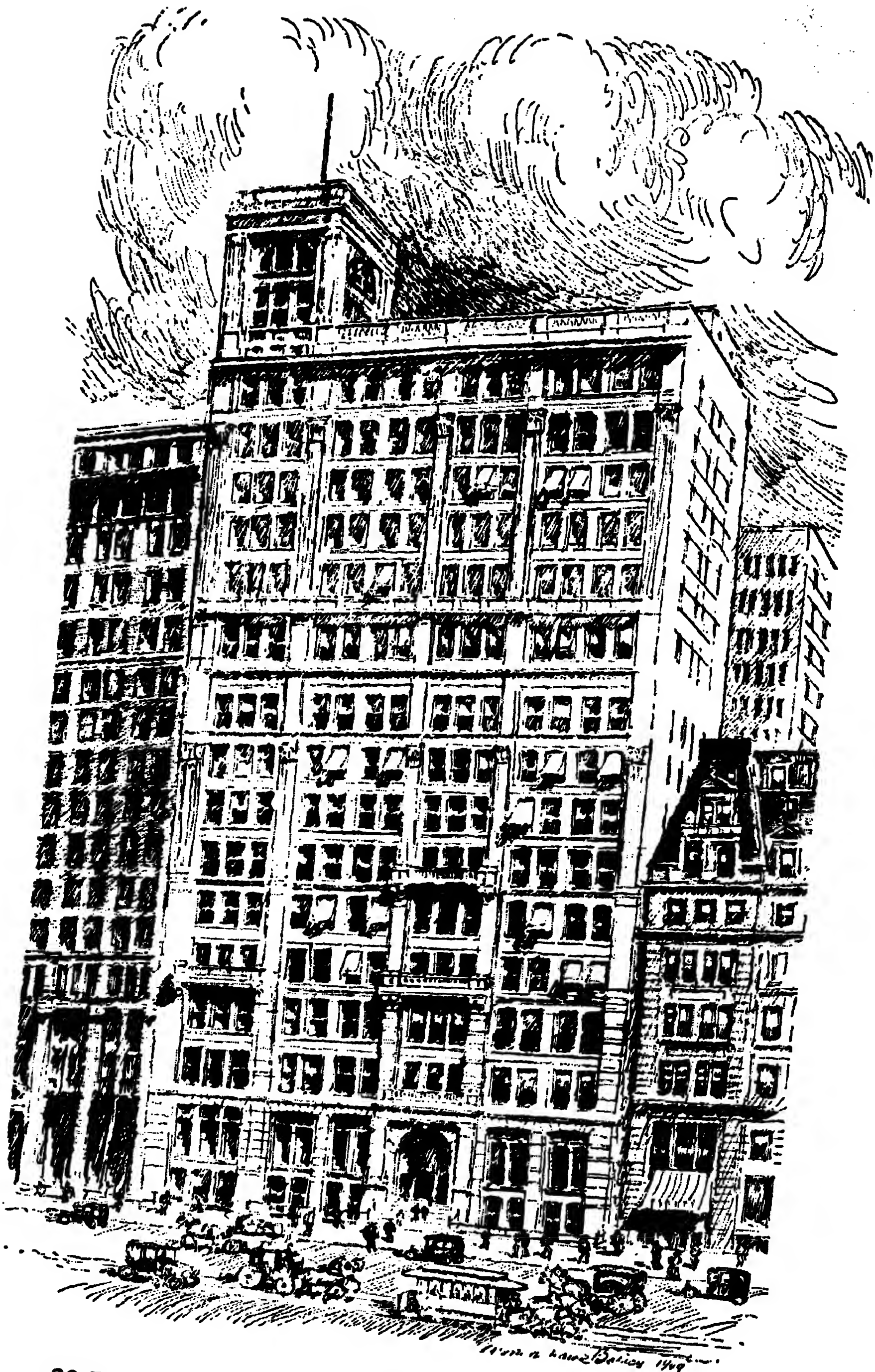
PIONEERING IN BIG BUSINESS

1882-1911

Prepared under the Auspices of the
BUSINESS HISTORY FOUNDATION, INC



26 Broadway, As It Appeared Between 1899 and 1922

HISTORY OF STANDARD OIL COMPANY (NEW JERSEY)

Pioneering in Big Business 1882-1911

by RALPH W. HIDY *and* MURIEL E. HIDY

HARPER & BROTHERS NEW YORK

A study by the
BUSINESS HISTORY FOUNDATION, INC.

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To our daughter, Ann Helen, and her four grandparents

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Foreword

THE Business History Foundation, Inc., is a nonprofit corporation chartered under the laws of the State of New York. It was organized to conduct research, to assist scholars, and to facilitate publication in the field of business history.

As a research organization the Foundation was designed primarily to undertake projects that require the co-operation of a group of scholars. Included in this category are the histories of the larger corporations in the United States, whose operations are of such scope and importance as to make imperative some general understanding of their nature and function. Especially for such projects is there need for an independent organization of experienced scholars whose approach is likely to be broad and impartial and whose findings will be available to the general public.

The Foundation was designed also to provide grants to individual scholars for research and publication in the field of business history. It has already assisted in the preparation or publication of a number of monographs and the *Guide to Business History*. As funds become available, the Foundation expects to increase the number of assistantships open to younger scholars and to expand its grants-in-aid.

The first research task undertaken was the history of the Standard Oil Company (New Jersey), which opened its records without restriction on research and publication. It also made a substantial gift—the first received—to facilitate the work of the Foundation. The Foundation has received other gifts and has already undertaken studies of two additional companies of importance in the history of American business.

The present trustees of the Foundation are Ray Palmer Baker, Chairman of the Board of Trustees of the Foundation, Vice-President Emeritus of Rensselaer Polytechnic Institute and Director of the Industrial Council; Charles W. Moore, President of the Foundation and Business Historian and Consultant; Ralph W. Hidy, Professor of History, New York University; Ralph M. Hower, Professor of Business Administration, Har-

vard University; John G. B. Hutchins, Professor of Business History and Transportation, Cornell University; and Henrietta M. Larson, Associate Professor of Business History, Harvard University.

RAY PALMER BAKER

December, 1919

Editorial Director's Introduction

The *History of Standard Oil Company (New Jersey)* is a case study in the development of American "big business" in the past seventy-five years. This history, in several volumes, of which *Pioneering in Big Business* is the first to appear, deals with the administration and operation of a large, vertically integrated company.

Has history anything to teach about big business that may be useful today? Is it helpful to learn how one large company came into existence and developed, to gain some comprehension of what it has accomplished and where it has failed?—to observe the external influences and internal processes which brought about innovations in the company's administration and its technology?—to measure the impact on business executives of a critical public opinion and of the efforts of government to regulate their activities?—to observe a company with world-wide operations at work in countries undergoing significant social and political change? In general, can a better understanding of our business system be gained from observing the process of policy development, of planning, of operations in a highly dynamic world? The volumes in this history of the Standard Oil Company (New Jersey) were written in the belief that the answers to these questions are affirmative.

This history is, however, more than a study in business administration. It is the history of a major company in an industry vital to our own country's development and strength, an industry in which the United States has played a world-wide role. The history of this company, therefore, in large measure epitomizes the dynamic development of one of our basic industries and the operations and relations of American business abroad.

Because there are several corporations bearing the Standard Oil name, it is important to understand what is meant by Standard Oil Company (New Jersey). From the time it was organized in 1882 until 1911, this corporation was a member and for a time the holding company of a large number of corporations popularly known as Standard Oil. Within that

group were several companies bearing the name Standard Oil Company, chartered in different states as indicated in the names of the individual corporations. A decision of the United States Supreme Court in 1911 separated from the holding company—the subject of these volumes—all but one of the domestic affiliates having the name Standard Oil Company. Since 1911 the Standard Oil Company (New Jersey) has had corporate affiliation within the United States with four companies in domestic operations bearing the Standard Oil name: Standard Oil Company of Louisiana, incorporated in 1909, which was merged with the Standard Oil Company of New Jersey in 1944; Standard Oil Development Company, chartered in 1922; Standard Oil Company of New Jersey, which was incorporated in 1927 and became the Esso Standard Oil Company in 1948; and Standard Oil Company of Pennsylvania, incorporated in 1928 and merged with Esso Standard in 1949. Among its other domestic affiliates are The Carter Oil Company, Interstate Oil Pipe Line Company, and Humble Oil & Refining Company.

The *History of Standard Oil Company (New Jersey)* represents in several respects an exploration of unknown territory. The company's executives took a step without precedent among large American corporations when they in 1947 granted to scholars over whom they had no control unrestricted access to the company records and complete freedom of publication. For the historians who undertook the work this was also a new and challenging venture. Never had any scholars in this country written from the records of a large living corporation the history of its administration and operation. This particular company, moreover, was one whose history was weighted with public controversy and whose operations have long been and still are of significance to countless individuals.

Research and writing were carried on under the auspices of the Business History Foundation. The basis for the original planning and arrangements for this history was a preliminary study, extending over a year, by members of the faculty and staff of the Graduate School of Business Administration of Harvard University. This exploration included discussions with numerous directors, executives, and other employees of the holding company and its major affiliates in the Western Hemisphere and a survey of the records of these companies and of pertinent printed materials. Research was begun in 1947. Professor N. S. B. Gras and I were in general charge, each for different periods devoting full

time to the project. Authors joined the Foundation staff at various dates from July 1, 1947, to December 1, 1948.

As the manuscripts were completed, they were submitted to the company for reading and criticism. Certain employees and annuitants read for the general over-all history; others for special subjects. From these readings came suggestions invaluable as to both detail and generalization. Particularly helpful were the suggestions of those who had been concerned with developments about which the authors wrote.

The company scrupulously observed all the conditions agreed upon in advance. In department after department of the Standard Oil Company (New Jersey) and in its affiliates the members of the Foundation's staff received courteous co-operation. No records requested were withheld; and authors and assistants were allowed free access to vaults and files. Executives gave generously of their time for interviews, but without attempting in any way to influence authors or assistants. The right of authors to determine what should be included—be it fact, generalization, or interpretation—was always fully maintained. The top administrators and others in the company manifested full appreciation of the principle that only a balanced and objective study would have substantial value as a contribution to the history of business.

Three primary volumes, to be supplemented by other studies, will be published in this series dealing with the history of the Standard Oil Company (New Jersey) and its affiliates. The present volume traces the history of the formation and growth of the Standard Oil group, which carried on the processes of oil producing, refining, and transporting, and of supplying a world-wide market; the volume ends with its dissolution by the United States Supreme Court in 1911. The second volume deals with the rebuilding and expansion, horizontally and vertically, of the Standard Oil Company (New Jersey), until by 1927 it was again well on the road to a balanced integration. The third volume is concerned with the company since 1927.

Other divisions of the work were considered, but the plan adopted was to place emphasis on the whole. Actually authors and assistants did research in the holding company and the affiliates by departments and divisions, that is, by functions. These were always visualized, however, as parts of a whole organism. Treating a time segment as a unit was a logical result of this conception.

One general observation should be made at this time in order to place the individual volumes in the perspective of the whole, that the Standard

Oil Company (New Jersey) has not remained the same kind of corporation throughout its history. Contrary to a widely held belief that big business has an essential character regardless of time and place and circumstance, over the generations of its existence this company has changed in certain fundamental ways. Significant developments have come in the company's relations with its competitors, its employees, the government, and the general public. These changes reflect a basic reorientation in the philosophy and attitudes of its top administrators as well as reaction to external conditions. Belief in the efficacy of competition, alone, as a regulator of economic life has given way to the acceptance of a measure of government regulation as a necessary thing; and the assumption that business is a private matter of concern only to its owners has been replaced by another which looks upon business as a functional part of society bearing a heavy weight of social responsibility. By such a process of evolution the Standard Oil Company (New Jersey) has adapted itself to a changing world, while it has been providing oil and oil products to the market in ways believed best to assure its own survival and growth.

Although the *History of Standard Oil Company (New Jersey)* is the result of the joint efforts of many individuals who participated in its preparation, each volume is essentially the work of its authors. There has been no attempt to achieve uniformity except in the over-all emphasis on administration and operation. Authors were selected for each volume because of special qualifications. They had full responsibility for the research for their volume, the research itself being conducted by one or two authors and their assistants. In all cases the authors made the final decision as to organization, factual content, generalization, and interpretation.

The volumes differ considerably in style and general organization. Naturally they reflect the individual qualities of the authors themselves. Some of the differences, however, are due to the fact that the volumes complement each other. It was necessary to include in Volume I sufficient factual detail on the oil industry and business to make the history intelligible to the reader unfamiliar with them. Each succeeding volume could, then, assume some familiarity with the company and the industry and could emphasize new problems and developments.

To make adequate acknowledgment of help given in the course of this undertaking is impossible. To the Board of Directors of the Standard Oil Company (New Jersey) for making possible this venture into a nearly

unknown historical field and to the directors of affiliates who gave permission to do research in their companies' records, we who participated in the project express our gratitude. To the many individuals within those companies who have assisted in countless ways we extend our thanks. For continuing help over the years, we are indebted to Mr. George H. Freyermuth, former head of the Public Relations Department of the Standard Oil Company (New Jersey), who recently was elected Executive Vice-President of Esso Export Corporation, and to Dr. Frank M. Surface, Consultant to the Executive Officers, who has had charge of our relations with the company. Acknowledgment is due also to the deans of the Graduate School of Business Administration of Harvard University and the Graduate School of Arts and Science of New York University for permitting members of their faculties to devote considerable time to the project.

On behalf of those who participated in the preparation of these volumes, I take this opportunity to record our feeling of indebtedness to N. S. B. Gras, Straus Professor of Business History, Emeritus, of Harvard University. He more than any other person created business history as a special field of academic study, and without his years of imaginative scholarship this work could not have been undertaken. He was the moving spirit in the organization of the Business History Foundation and until his retirement its president and director of research. In this project, as in his earlier work in the history of companies, he set a standard of independence for the author and for relations with the company which represents time-honored principles of historical scholarship. He helped historian and executive, alike, to envisage the writing of the history of the company as a contribution to that fund of knowledge which is a necessary foundation for the general understanding of our business system and for its wise administration.

Henrietta M. Larson

December, 1919

Authors' Preface

"A WORK of art is an orderly unity: life is a heterogeneous tangle," wrote Lord David Cecil in *Poets and Story-Tellers*.[1] "The writer has to devise a form for his inspiration which will at once please us as an artistic pattern and give us a convincing impression of disorderly reality. In addition to reconciling fact and imagination he must reconcile fact and form. It is a hard task." The authors wholeheartedly agree with this statement of an author's problems and enthusiastically endorse the truth of the final sentence.

This volume is based on data from a large number of sources. The Standard Oil Company (New Jersey) has given us a free hand in examining old records still in existence. Officials in the company opened their vaults and files, then invited us to proceed. Special mention should be made of the continuous records preserved by the Comptroller's Department, the Law Department, and the Secretary's Department. Unfortunately for the historian, the dissolution of the combination in 1911 put many records of the early Standard Oil family into the hands of corporations now entirely independent of their former affiliation, but historically minded men in some of these firms preserved old records and officials have generously made them available to us. Mr. John D. Rockefeller, Jr., graciously opened his father's correspondence to us. Even with these sources, however, much of the record would not have been revealed had not Standard Oil been the subject of keen public interest during the years under review. Oil experts from various countries visited the United States and recorded the achievements of the combination, writers for newspapers and periodicals found Standard Oil a subject for copious copy, and testimony in court records is voluminous. The reader will find the sources listed in the notes.

The diversity as well as the volume of the materials necessitated the application of varying techniques to the use of data. Gaps in information on some segments of the story were so marked that we, like medieval

[1] Reprinted with the permission of The Macmillan Company, New York, which published the book in 1949.

historians, had to squeeze every possible bit of meaning from available evidence. In other areas the plethora of documents presented us with the necessity of selecting for presentation those data which expressed the fundamental truth found in the mass. Testimony in litigation and investigations put in the public record a host of facts, but many of those facts had little bearing on the questions which we wanted to answer. Lawyers intent on eliciting evidence to prove a point at law did not have the needs of the business historian in mind. Selection of the pertinent data was essential.

In portraying the meaning and significance of the facts assembled we have tried to live up to accepted canons of historical scholarship. We have attempted to be accurate, objective, and impartial and to put actions of Standard Oil men within the framework of experience, custom, and law during the years from 1882 through 1911. The behavior of John D. Rockefeller and his associates, large and small, seemed to us to be most realistically presented as a result of decisions made in response to a succession of prods and pressures. Among the influencing factors were habit, inertia, pride, desire for profit and prestige, normal human reactions to the novel and the disproportionately powerful, new economic developments, modifications in public beliefs and concepts, and the political and legal climate arising from the convictions, reasonable and unreasonable, of an electorate swayed by the politicians and the press.

This book is the biography of the Standard Oil combination, not the Standard Oil Company (New Jersey) alone, thus making this volume an analysis of a separate and distinct phase of that corporation's history. Since Jersey Standard lived for its first twenty-nine years within an integrated aggregation of companies under the rules and customs of the group, it seemed to us that to write of the Jersey Company alone would have necessitated stressing legal organization at the expense of economic reality.

Two other concepts appear throughout the narrative and analysis. Decisions for the combination were made by a team of men, not one, though the team was captained successively by John D. Rockefeller and John D. Archbold. At the same time, we were convinced that generals do not win campaigns without subordinate officers, corporals, and privates. For that reason, as far as we could, we have woven into the story the ideas and activities of men who drilled the wells, operated the pipelines, processed the crude oil, and marketed the products.

We have made no systematic effort to correct specific errors and mis-

conceptions about Standard Oil and its leaders. To have done so would have required a second volume as large as this one, a prospect as appalling to the authors as to potential readers.

The illustrations for the book have come from a number of sources. Most of the pictures were provided by Standard Oil Company (New Jersey) and were prepared under the supervision of Mr. Charles Springhorn. The photograph of Henry C. Folger, Jr., the cartoon of Daniel O'Day, and the advertisement of Charles Pratt & Company came from Socony-Vacuum Oil Company, Inc. The portraits of Charles C. Burke, Charles M. Everest, Charles Miller, Charles M. Pratt, and William Rockefeller were taken from Crum and Dungan's *Romance of American Petroleum and Gas,* and Mrs. Henry Noble MacCracken furnished the photograph of her father, S. C. T. Dodd. The frontispiece was drawn by Vernon Howe Bailey, and the maps and diagram were prepared by Wittich Holloway.

To acknowledge adequately by name all those who aided us in collecting materials for the book would be impossible in the brief space at our disposal. We are grateful to all the Standard Oil people who permitted us to use their offices on occasion and we are equally appreciative of those who opened the vaults for our use when no other rooms were available. In the parent company individuals who gave aid and advice ranged from keepers of the archives to vice-presidents. Without co-operative assistance from men in Italian, German, and British affiliates, not to mention those in the United States and Canada, our task would have been impossible of achievement. To Messrs. George Freyermuth, N. D'Arcy Drake, and Dr. Frank M. Surface go our particular thanks for initiating and maintaining our pleasant relations with the various departments of the parent company and with its present and former affiliates.

Many of the data in the book came from libraries. Our sincere appreciation goes to those who courteously helped us in the libraries of the Standard Oil Company (New Jersey), the Law Department of Esso Standard Oil Company, the American Petroleum Institute, and the School of Commerce, Accounts, and Finance of New York University. We give particular thanks to the staff of the New York Public Library for their cheerful helpfulness throughout the past seven years.

Among those who aided us in gathering data two merit especial recognition. Mrs. Hélène M. Dunn not only did typing and research but also shared our enthusiasm for our task. Dr. Elizabeth Bacon came to us

when we needed help and did a masterly job of research on the extensive legal records of the combination. We thank them both.

We also owe an immense debt to all the people who have read our manuscript and made suggestions for its improvement. Among those who have thus contributed their knowledge to our aid are present and retired directors of the Standard Oil Company (New Jersey), company specialists in various functions of the petroleum industry, the trustees of the Business History Foundation, Incorporated, and authors of other volumes in the series on the history of Jersey Standard. Professor Allan Nevins and Mr. Frank Hill have given us the benefit of their familiarity with the life of John D. Rockefeller and with Standard Oil activities. Numerous significant suggestions were made by Professors Thomas R. Navin, Powell Nyland, John G. McLean, and Richard S. Meriam of the Harvard Graduate School of Business Administration. We were particularly happy to have Professor A. P. Usher, one of the deans of economic history in the United States, as a reader of our final manuscript. Mrs. Elsie H. Bishop checked our grammar, eliminated inconsistencies, and made the index.

To the two directors of our research and writing we can scarcely express our appreciation. Out of his rich experience in business history Professor N. S. B. Gras gave us suggestions for broad interpretations and ideas as to the significance of specific bodies of information. Professor Henrietta M. Larson was more than generous with her energy, knowledge, and time. She contributed guidance in research, aid in organizing data, constructive criticism of the manuscript at every stage of its evolution, and encouragement when the task seemed extremely difficult.

Although we are truly grateful to many people for their aid and counsel, the fact remains that we did most of the research for the manuscript and all the writing. Under those circumstances we must accept full responsibility for the accuracy of the facts presented as well as the interpretation of them.

Ralph W. Hidy
Professor of History
New York University

and

Muriel E. Hidy
Associate of the
Business History Foundation, Inc.

December, 1919

PART I

THE EARLY YEARS OF JERSEY STANDARD

Chapter 1

From Chaos to Combination

DURING THE years from 1882 to 1911 the leaders of the Standard Oil group of companies, including the Standard Oil Company (New Jersey), carried out an extraordinary experiment in the management of a business. John D. Rockefeller and his associates successfully created and applied a system for operating a large, integrated industrial enterprise which was one of the earliest representatives of Big Business, to use the phrase popular in the United States. As executives of the large combination those men contributed greatly to the rapid development of the American petroleum industry and through it to the growth of the economy as a whole. Being innovators, however, they also made numerous mistakes and learned only slowly that large size and concentrated economic power in a democratic society required conduct conforming to new rules set by popular demand.

The early life of the Standard Oil Company (New Jersey), generally referred to as Jersey Standard, was marked by rapid growth from infancy to early parenthood. Organized as one of the units of the Standard Oil Trust in August, 1882, for its first ten years the corporation existed primarily as the owner of a refinery and other manufacturing establishments at Bayonne; late in the decade the company acquired a few wholesaling facilities in the same northern New Jersey area. As a consequence of a court decision in Ohio in 1892, Standard Oil executives reorganized their enterprise under twenty corporations of which Jersey Standard was one of the three largest; top managers vested this company with direct ownership of extensive additional manufacturing and marketing properties and also made it one of the holding companies within the group of sister corporations. The Jersey Company continued to perform operating functions after it had become the parent of the entire combination in 1899.

As the apex of a pyramid of companies dominating the American petroleum industry, Jersey Standard naturally became the symbol of the much-

distrusted Standard Oil "monopoly" in the public mind. In 1911 the Supreme Court of the United States, affirming that general conviction, broke up the combination by divesting the Standard Oil Company (New Jersey) of thirty-three affiliates, thus bringing to a close one eventful and significant phase of the corporation's history.

Since the Standard Oil Company (New Jersey), either as a member or as the legal parent of the Standard Oil group of companies, was merely an instrument of men managing a large, integrated enterprise, this history presents the record of the combination as a whole for all the years from 1882 to 1911. It is the story of a world-wide enterprise, though illustrations of policies and practices are drawn, whenever possible, from the activities of those units which figured in the history of Jersey Standard not only before 1911 but later as well.

Just as a biographer of a man acknowledges the imperative necessity of explaining the individual as a product of numerous ancestors and antecedent circumstances, so must the historian of a business. Without a brief excursion into the history of the petroleum industry in the years preceding 1882, the formation of the Standard Oil Trust and the heritage of Jersey Standard would be inexplicable. The Trust was the response of a dynamic team of men, headed by John D. Rockefeller, to a host of unco-ordinated stimuli springing from the conditions of the oil business in the United States after 1859.

YEARS OF UNCERTAINTY, 1859-1870

The men who set the early pattern of the Standard Oil group of companies got their business experience and crystallized many of their convictions during the decade of the 1860's. Almost all young men, they naturally became products of their time and of the conditions in their chosen field of endeavor. The concepts and behavior pattern of the small farmer and the small businessman dominated the economic scene. Unrestricted competition prevailed in most sectors of the economy, and the virtues of competitive enterprise were upheld by both theorists and entrepreneurs. In the petroleum industry competition was strenuous, often cutthroat in character. Not unnaturally, Standard Oil executives believed in the validity of some of their youthful practices all the days of their lives. On the other hand, the excesses of competition in the petroleum industry induced them to attempt to mitigate the uncertainties of the business through combination and to be willing to depend on team play, which became one of the chief strengths of their organization.

The long search for a better illuminant than whale oil and tallow candles reached fruition in Edwin L. Drake's dramatic demonstration of the feasibility of drilling for petroleum on Oil Creek, near Titusville, Pennsylvania, on August 27, 1859. For a generation men in many parts of the Western world had been seeking a bright-burning, safe, and inexpensive illuminating oil. They had devised various substitutes for whale oil, none of them very satisfactory until 1850, when James Young of Glasgow, Scotland, patented a method for extracting a crude liquid hydrocarbon from coal and shale. By distilling the liquid extract Young produced a top fraction known as naphtha (now popularly called gasoline), a second which came to be called coal oil or kerosene, and a third providing lubricants and paraffin wax. Partly through indigenous development by such innovators as Abraham Gesner, Joshua Merrill, and the Atwood brothers, and partly through adoption of Young's techniques, scores of coal oil manufacturers sprang up in cities and towns of the United States during the 1850's. While these innovators were developing a market for kerosene made from coal, a few producers and refiners of petroleum from surface seepages and salt-water wells also began to market their raw material and its derivatives. Marketers pushed sales so effectively that the spread between the cost of crude oil at the wells and the selling price of the product, kerosene, attained more than a dollar per gallon in 1859. Coal oil manufacturers had built a market which promised great rewards to those who found a ready supply of inexpensive crude petroleum.[1]

Drake's followers and emulators created a vigorous industry within ten years. Annual production of crude oil, centered in northwestern Pennsylvania in the valley of Oil Creek, rose from 2,000 barrels in 1859 to 4,800,000 ten years later and to 5,205,000 in 1871. Processors of petroleum sprang up in several towns of the Oil Regions, as the expanding producing area was called (see map in Chapter 4), and also in such relatively large consuming centers as Pittsburgh, Parkersburg, Louisville, St. Louis, Cleveland, Baltimore, Philadelphia, Boston, Portland, and New York. Kerosene, the chief product of crude oil, was adopted eagerly by consumers in the United States and by 1872 had entered all the major markets of the world, including Japan, only recently opened to Western commerce. Marketers began to develop a small demand for such by-products as naphtha, lubricating oil, and paraffin wax, not only in the United States but in many foreign lands.

In building their dynamic industry American oilmen practiced "cul-

tural borrowing" at a speed and to a degree seldom witnessed before or since. From artesian well drillers they borrowed tools, techniques of boring, methods of generating power, and storage facilities. Wagons, railways, barges, sailing ships, and a few steamers served as means of transportation. Containers suitable for oil had been developed by the makers of barrels. From the coal oil industry petroleum refiners took equipment and methods of distilling and treating of distillates with sulphuric acid and caustic soda. Manufacturers of lubricants and paraffin wax learned their procedures from the coal and shale industry and from pressers of lard and linseed oils. All finished petroleum products at first went through established channels of trade—merchants, commission merchants, agents, wholesalers, jobbers, grocers, and hardware dealers—for ultimate use in lamps adapted from those used for camphine and coal oil or upon machinery formerly lubricated by animal and vegetable oils.

Early oilmen labored against serious difficulties for many years. Capital was not easily obtained for the new, risky enterprise. Managers and workers alike had to acquire skills through experience over a period of time. The number of speculators in bogus stock companies and in crude oil reflected adversely on businesslike operators, especially in the boom and depression of 1864-1866. When Drake's well came in, there were no railroads within many miles of Titusville, and teamsters had a monopoly of hauling oil in barrels from wells to refineries, water routes, and railheads. The railways had no means of carrying oil in bulk. Refiners knew little about handling different qualities of crude oil and even less about manufacturing lubricants. Marketing facilities were unsatisfactory, for wholesalers of all types of vegetable and animal oils, as well as retailers of groceries and hardware, had no particular incentive to concentrate on sales of petroleum products and thus to develop demand commensurate with increasing production.

On the other hand, American oilmen enjoyed many favorable circumstances beyond the existence of a ready-made market and available techniques of producing, storing, manufacturing, and marketing petroleum and its derivatives. Pennsylvania-grade oil yielded a high percentage of kerosene, the chief product in demand, and a correspondingly small amount of less-wanted naphtha, lubricants, and wax. The relatively low sulphur content of Pennsylvania oils also made the treating problem simple. Initiated in 1861, the protective duty on kerosene was set at forty cents per gallon four years later. More advantageous to the petroleum industry in the United States than the tariff, over the long run, was

the fact that the market was expansive; the population and economy of the whole Western world, especially the American part of it, were growing rapidly; the demand for kerosene soon proved to be world-wide. Every literate householder wanted the new cheap light, while the increasing mechanization of industry promised growing sales of lubricants and greases.

Taking both favorable and unfavorable circumstances in their stride, American oilmen created an industry typical of American businesses at the time, especially those based upon mining a mineral. Producers of crude oil, refiners, and marketers alike overwhelmingly operated as individuals or in copartnerships; corporations were few. At first almost all firms in the industry specialized in one function—drilling, producing crude, barrelmaking, barrel repairing, or tankmaking; most refiners prepared only one product for market, either kerosene or naphtha or lubricants and wax. There were no wholesalers or retailers concentrating entirely on the sale of petroleum products. Little capital was needed for entry into any phase of the industry. Unrestrained competition prevailed or was as closely approximated as in any other industry at any time in American history.

Although a modicum of middle-aged men leavened the mass, youth predominated in the oil industry, particularly after the veterans of the Civil War poured into the business. It was as natural for young men to be more numerous in hazardous petroleum operations as it was for them to dominate the populations of Carson City and Poker Flats. And their very youth added to the ruthlessly competitive pattern of producing, refining, and marketing petroleum products which soon developed.

The behavior of oilmen in this highly competitive situation epitomized, even exaggerated, the market techniques of small businessmen everywhere in the United States in the 1860's. The short-run view prevailed almost everywhere. In an age when the concept of one price for a product was not fully accepted even in wholesale markets, oilmen yielded to no one in price cutting and bargaining. Circumvention of patent rights was applauded by many; Colonel E. A. L. Roberts, the inventor of the torpedo for expanding the yield of wells, had to institute suits by the hundreds to maintain his monopoly granted by the federal government. Every man in the petroleum business tried to keep secret all his advantages, whether concessions from suppliers or rebates from railroads or his volume of sales or his profits. In this practice the oilman was merely following the precedent of thousands of years of experience on

the part of businessmen large and small; "my business is my own" was a concept reiterated from ancient Phoenicia to the twentieth century. The only way to be sure of a competitor's activities was to spy upon him, a practice sanctified in action by producers, refiners, and marketers alike in the early days of the industry. Open condemnation of a rival's product and behavior was almost standard competitive practice, not only in the oil business but also in other occupations; it was well exemplified in journalism by the explosive outspokenness of James Gordon Bennett. Such was the behavior pattern observed, learned, and practiced by young oilmen of the 1860's—those who led the industry till the twentieth century in Standard Oil and outside it.

One of the most significant early developments in the industry was the application of the common law to the production of crude petroleum. The concept that ownership of land conveyed rights to minerals in the subsoil had long been accepted in Anglo-Saxon countries. Basing decisions on the premise that crude oil was a fugacious mineral, judges also sanctioned the practice of oilmen that landowners or leaseholders who brought petroleum to the surface had the title to it. This fact encouraged the drilling of as many wells as possible in any proven producing area and maximized waste of gas pressure and oil alike. It led to evanescent flush production and rapid exhaustion of reservoirs of oil and hence contributed to wide fluctuations in volume of production and price.

While seeking competitive advantages, oilmen used empirical methods to the full and added dynamic qualities to the industry in the process. Drillers and producers increased the weight and effectiveness of tools, introduced the casing of wells with pipe, and began the adoption of first wooden, then iron, tanks for field storage. Refiners improved stills and condensers, adopted cracking to maximize the yield of kerosene, discovered how to use bone charcoal to deodorize lubricants, introduced distillation with steam under pressure and distillation under vacuum to produce better lubricants, started packaging products in cans and cases, and created brand names and trade-marks by the score. Samuel Van Syckel built the first commercially successful pipeline in 1865 and was emulated soon by other lines serving the Pithole field; numerous circumstances shortly led him into bankruptcy. Pipeline men soon added careful gauging of tanks and improved pumps. They systematized all operations by issuing certificates for oil received, developing accounting methods, and instituting charges for storage, losses by fire, and B. S. & W. (bottom settlings and water). Almost as soon as the Densmore brothers

had inaugurated bulk transportation of oil on the railways with two wooden tanks on a flat car, the first type of the now familiar cylindrical tank car superseded it for handling both crude oil and finished products. Oil exchanges were organized for dealing in crude oil certificates.

In spite of improved techniques, and often as a result of them, men seeking livelihood and wealth in the oil industry found the business uncertain indeed. New oil pools came and went with appalling rapidity, with consequent losses to producers, pipeline operators, and refiners. Prices of crude oil reflected the feast or famine character of production; monthly averages ranged from $0.10 per barrel to $2.25 in 1862, from $4.00 to $12.125 in 1864, and from $3.825 to $4.825 in 1871. Kerosene prices fluctuated with, but not in proportion to, those of crude petroleum, and local price wars gave variety to the pattern. Failures among producers and refiners occurred by the score, not only as a result of fluctuations in economic life generally, but also in consequence of changes in the petroleum industry and managerial incompetence. The incidence of failure was especially high during the years 1864-1867 among Civil War veterans who had little or no knowledge of the oil business. Waste of crude oil was continuous from producing to marketing, and loss by fire was endemic to the industry. Lack of balance between functions was chronic: first production would outrun the throughput by refiners; then manufacturing capacity would exceed both current production of raw materials and the rate of consumption of finished products. Oilmen knew from bitter experience that their business was wasteful, risky, hazardous, and unstable. Yet the rich rewards of the successful in the industry continued to attract many to it.

REACTIONS TO INSTABILITY, 1859-1870

Responses of oilmen to the hazards of their business during the 1860's were as varied as the individuals themselves. The overwhelming majority remained small independent specialists in one function or another of the industry. A few sought to reduce unit costs through expanding the size of their operations. Several attempted to build a market for a high-quality product or in a particular area. Not an inconsiderable number of prudent oilmen, including a large number of those who had been successful over many years, began early to spread their risks in the hope that what they lost on the roundabout they would make up on the swings, as expressed in the old circus ditty. The idea of combination in the petroleum industry had emerged out of the uncertainties of the business itself long before the

Standard Oil group was formed. Several types of co-operative enterprise were utilized.

Chiefly through interlocking partnerships, a few individuals adopted both vertical and horizontal organization of their efforts in order to diversify their responsibilities, insure themselves against losses, and assure a measure of profit. William Barnsdall, the driller of the second successful well in Pennsylvania, became both a producer and a refiner. Adnah Neyhart, J. L. and E. G. Grandin, H. L. Taylor, John L. Satterfield, the Fisher brothers, and others entered into a whole series of partnerships to drill on different leases and in different areas. The Phillips brothers had numerous partners and for drilling the first well on high land organized a corporation—The Ocean Oil Company—so that the risk of a relatively expensive operation, all earlier drilling having been in valleys, would be spread among a number of investors. As a stockholder in another of the early producing corporations, the Columbia Oil Company, Andrew Carnegie acquired a part of the capital for his early ventures in steel manufacturing and fabrication. At one time, Jacob Jay Vandergrift, whose original specialty was transportation, was active in at least six producing firms and later added a refinery at Oil City. W. H. Abbott, a famous pipeline man, engaged also in buying and refining crude oil.

On various occasions producers formed associations, two of which were broadly inclusive. Organizations in several localities attempted unsuccessfully in 1866 to enforce shutdown of wells and to reduce drilling in order to raise the price of crude oil. The temporary informal association which during the same year induced Congress to repeal the dollar per barrel tax on crude oil constituted the first organization really to represent all the producers in the Oil Regions. The Petroleum Producers' Association of Pennsylvania, founded in February, 1869, was intended to attack abuses in the oil business and to protect the interests of the members. It opposed unfavorable state legislative proposals, attacked the Roberts torpedo monopoly, and began issuing monthly statistical reports on producing activity.

The competitive situation fostered combination among the pipelines. At this time the short lines gathered the oil in the field and transported it to refineries and delivery points on rivers and railroads. The most active investors in and managers of the early gathering lines were buyers of crude oil. To assure a steady supply of petroleum for their purpose, managers of each line tended to lay pipe to each new producing area. Though this policy spread the risks in operating a firm, it led to duplication of

lines, rate cutting, and destructive competition. Since a pipeline had to be employed at near-capacity to operate profitably, weakly financed or inefficiently managed firms soon were candidates for bankruptcy or merger, particularly in those early days of rapidly declining fields. Also seriously concerned at maintaining a regular flow of oil freight, the major railroad companies serving the Oil Regions helped to organize and participated in the ownership of the four gathering systems that had emerged by 1871.

Three of the four leading pipeline groups had ties with either the Erie or the Pennsylvania Railroad, or both. The Pennsylvania Transportation Company, which started with the original Van Syckel line as its nucleus, boasted directors from both the Erie and the Pennsylvania. Adnah Neyhart, the key figure in The Tidioute Pipe Line Company, shipped largely over the Philadelphia & Erie, an associated line of the Pennsylvania system. In 1865, that same railroad organized The Empire Transportation Company, a general freight-expediting unit serving points as far apart as Omaha and Jersey City. Empire's chief executive, Joseph D. Potts, immediately concluded a special contract with the Philadelphia & Erie and began developing a pipeline system within a year.

The partnership of Vandergrift & Forman, through building, buying, or leasing, was also operating a series of gathering lines by 1871. Though the firm as yet had no ties with any major railroad line, before many years the New York Central was to be its close associate. Vandergrift & Forman's holdings later became the core of the United Pipe Lines, the Standard Oil unit which ultimately absorbed all or part of the other three early systems as well as many smaller lines.

Until after 1870 few processors of petroleum moved far from specialization in one operation. Most refiners of kerosene, the chief product, sold the top cut to near-by specialists in rerunning naphtha distillate, such as W. H. Doane in Cleveland and W. L. Elkins & Company in Pittsburgh, both later members of the Standard Oil family. The processing of tar or lubricant stock, the residuum after the removal of the kerosene fraction, also rested largely in the hands of such separate entities as Backus, Williams & Company and Meriam, Morgan & Company (later Meriam & Morgan Paraffine Company) of Cleveland, and Libby, Bartlett & Kimball, R. W. Burke, and R. H. Chesebrough in the New York City area, to name a few whose firms later were either absorbed by or associated with Standard Oil. All these firms manufactured lubricants and wax except Chesebrough, who had started to specialize in making vaseline. Rising

specialists in manufacturing lubricants alone at this time included the Vacuum Oil Company of Rochester, New York, and the Galena Oil Works, Limited, and the Eclipse Lubricating Oil Company, Limited, both at Franklin, Pennsylvania.

A number of oilmen in Pittsburgh evolved a distinctive co-operative technique in order to maintain the independence of refiners while achieving the advantages of relatively large-scale buying of crude oil and selling of finished products. Commission merchants (also known as agents or factors) contracted to perform these functions for a number of refiners. Among the leading factors who later joined the Standard Oil group were Waring, King & Company and Lockhart & Frew, sometimes called Lockhart, Frew & Company. By the early 1870's the latter, the more famous of the two firms, participated in the ownership of, and service to, at least six plants in the Pittsburgh area, including the one owned by the Standard Oil Company (Pennsylvania), organized in 1868. This corporation was the first to bear the Standard Oil name.

In competition with the other Pittsburgh commission merchants, the partners of Lockhart & Frew established a sister house in Philadelphia—Warden, Frew & Company. It participated in the organization of The Atlantic Refining Company in 1870 and assumed full responsibility for managing that corporation. In that connection the functions of Warden, Frew & Company included the construction of the plant, purchasing all supplies, operating the refinery, and selling the finished products, all for a commission of 5 per cent on the net earnings of Atlantic Refining.[2]

In every major refining area except Baltimore a few firms had begun to attain distinction for the large size of their plants or for other reasons. In plants at Boston, Portland, and Corry (Pennsylvania), Samuel Downer, a former coal oil manufacturer, had probably done more than any other refiner to set high standards of quality and to introduce new techniques. His association with the three leading early experts in refining—the Atwood brothers and Joshua Merrill—greatly facilitated his efforts to produce goods of standardized quality and to manufacture such by-products as paraffin wax. In the New York area the leading firm, though far from dominant in size, was Charles Pratt & Company, manufacturer of one of the most famous brands of kerosene, Astral. Another firm in the vicinity, the Devoe, specialized in manufacturing and canning illuminating oil for export, a technique apparently originally pioneered by Downer. The largest plant in Pittsburgh was managed by Lockhart & Frew, while Porter, Moreland & Company and Bennett, Warner &

Company easily led all competitors in the Oil Regions, as did J. N. Camden at Parkersburg, West Virginia, down the Ohio River. All the firms named, except Downer, were among the earliest participants in the later Standard Oil combination.

The most conspicuous example of growth in size was afforded by The Standard Oil Company (Ohio), organized in 1870 as a million-dollar corporation in Cleveland. Relatively near the source of petroleum and the rapidly growing population of the Middle West, the city offered many advantages to refiners. There was ample fresh water to operate the refineries. Competing railroads as well as the Great Lakes and the Erie Canal assured advantageous transportation both east and west. The new company was built on a business originated in 1863 when John D. Rockefeller and Maurice B. Clark, partners in a mercantile commission house, and two of Clark's brothers decided to join Samuel Andrews, a self-taught refiner, in manufacturing kerosene. After two years of operating their first refinery, the Excelsior Works, Rockefeller and Andrews bought out the Clarks. Rockefeller, destined to be the most prominent figure in American petroleum history, then concentrated his entire time and energy in the operating and expanding of refining operations. His brother, William Rockefeller, was brought into partnership, and a second refinery, the Standard, was erected. William soon departed for New York to act as sales agent and financial intermediary there. In 1867 Stephen V. Harkness contributed additional long-term funds, and Henry M. Flagler joined the firm as a managing partner. The Excelsior Works, with a capacity of 505 barrels per day, were considered the largest in Cleveland in 1865, and the combined facilities of Ohio Standard at its organization constituted the largest refining capacity of a single firm in the world. During 1870 the corporation also acquired a refinery in Brooklyn, the Long Island Oil Company, to assure products for increased sales of oil in the East and for export. Not relying on size alone for reducing unit costs and seizing a larger share of the market, Rockefeller and his associates had begun to engage in several auxiliary enterprises—owning lumber, paint and barrelmaking equipment, lake transshipping facilities, tank cars, tankage, sidings, warehouses, and lighters.

By 1870, it has been seen, oilmen had manifested several types of reaction to the instability of their industry. Encouraged by inclination, limited availability of capital, and general conditions of the business, the majority of producers, refiners, and marketers continued to operate on a small, individualistic basis. Leading producers, however, had enlarged their

opportunities and diversified their risks by utilizing interlocking partnerships and corporations for different drilling operations. An inclusive organization of producers had begun to function. Some men had integrated their activities by engaging in two or more of the functions of producing, storing, transporting, and refining. Operators of gathering lines had displayed a marked tendency toward combination, and four main systems of lines had emerged. Though marketing remained highly individualized in organization, in some cases a few units were beginning to show greater strength over a wider area than their competitors—Chess, Carley & Company south of the Ohio River, H. C. Pierce & Company in St. Louis and south to the Mexican border, and P. C. Hanford around Chicago, to name a few. Refiners in Philadelphia and Pittsburgh had made extensive use of commission merchants to attain the economic advantages of co-operative efforts. In every major refining area a few refiners were beginning to pull ahead of the rank and file in size. The Standard Oil Company (Ohio) was the largest refiner in Cleveland, even in the United States, and had demonstrated the profitability of absorbing auxiliary manufacturing.

CREATING THE STANDARD OIL ALLIANCE

The Standard Oil alliance, a community of interest among stockholders in various companies, was the product of the experience of oilmen in the 1860's and in the depression of the 1870's. During the earlier period men in the petroleum industry had witnessed the rigors of competition, the beginnings of combination, and the emergence of a few units of dominant size. Operating conditions for refiners began to be unsatisfactory in 1871 and grew worse in ensuing years. The struggle for survival became intense. Only in the light of events during the years from 1871 to 1881 can the reasons for the formation, growth, system of joint decision making, and success of the Standard Oil combination be understood. The leaders of that organization were not the only oilmen to adopt horizontal and vertical combination, but the Standard Oil version towered above all others in size and geographical inclusiveness.[3]

Two developments in 1871 put pressure on refiners, particularly those in Cleveland, to seek new avenues for assuring profits. During that year profit margins narrowed drastically. Basic to the general situation of the refiners was their excessive expansion of plant in the prosperous years of 1867-1869. Consumption of kerosene rose at a slower pace than refinery capacity. Average annual crude oil prices fell 19 per cent between 1869

and 1871, kerosene prices 25 per cent. During the latter year refiners experienced an extra squeeze by virtue of the fact that the average annual price of crude rose 12 per cent above that for 1870 while the selling price of kerosene was dropping 8 per cent.[4] In May, 1871, The Empire Transportation Company reduced its rates, a change which improved very slightly the competitive situation of plants in Pittsburgh and Philadelphia but effectively aided refiners in New York and the Oil Regions of Pennsylvania. The action of the Empire destroyed the relative advantage in freight rates on shipments of oil enjoyed by Cleveland, which had been one factor in the recent emergence of that city as a leading refining center.

To alleviate the conditions of depression, refiners could adopt one of several alternatives. They could try to stay in the race by remaining completely independent and hope to survive by endeavoring to reduce unit costs and to expand markets; this was essentially the position taken at first by the processors of petroleum in the New York area and in the Oil Regions. Another alternative was chosen by Rockefeller, Flagler, and their associates, who concluded that the stability and security of earnings lay in the formation of a closely knit association of stockholders of all refining companies in the Eastern part of the United States. These men believed that only common ownership would assure effective management and control. As another recourse groups of manufacturers could work under an agency system for purchasing crude, selling products, and negotiating rates with railroads. Manufacturers in Pittsburgh and Philadelphia were already operating under such a system and might be united still more closely, either under one agent in each city or under one for all refiners in both cities. In fact, a national organization along these lines was a possibility.

Both before and after participation in other attempts at unity Rockefeller and his associates proceeded along the path of common ownership. Through purchases made between November, 1871, and the middle of the following March, Ohio Standard acquired the firm of the largest buyer of crude oil and refined products in the New York area (J. A. Bostwick & Company) and absorbed another New York selling agency, six tar distilling plants, and eighteen refining units, including one in the Oil Regions.[5] Payment was made in stock of Ohio Standard or cash or both. Into The Standard Oil Company (Ohio) the purchases brought leases, equipment, trade-marks, patents, market connections, and such able executives as Oliver H. Payne, Jabez A. Bostwick, Ambrose Morrison

McGregor, W. C. Andrews, Horace A. Hutchins, and Frank Quarles Barstow. By 1872, Benjamin Brewster, railroad man and former California merchant, had also appeared as an investor in the Ohio corporation.

As a means of effecting a united front among refiners, the agency system was attempted in the South Improvement Company early in 1872. The first subscribers were P. H. Watson of the Jamestown & Franklin Railroad and the leading figures among the Pittsburgh and Philadelphia commission agents. Men from Clark, Payne & Company, Ohio Standard, and J. A. Bostwick & Company soon participated. Through the new corporation refiners would buy all their crude oil and negotiate all contracts with railroads; it would act as "evener," that is, administer the allocation of quotas in the oil traffic pool to be formed at the same time by the Erie, New York Central, and Pennsylvania railroads and associated lines. Compensation to the South Improvement Company for its services as evener were to take the form of a commission upon all shipments of petroleum from the Oil Regions—on shipments both by stockholders of the company and by their competitors. This and preferential rates to the South Improvement Company were to implement the intent of bringing all refiners into the organization as stockholders. Before the scheme went into operation a premature announcement of increased open railroad rates set off tempestuous opposition by producers and both large and small refiners in the producing and New York areas. The railroads abrogated the contract, the Pennsylvania legislature repealed the charter of South Improvement, and the United States House of Representatives made an ineffectual investigation.

Association with the South Improvement Company was probably the greatest mistake of Rockefeller, William G. Warden, and other later Standard Oil executives who participated in it. Rockefeller neither started it nor thought of it as the best way to get unity in the oil industry, but he threw his entire weight behind this effort to attain co-operation among refiners and to stabilize railway rates. Warden's whole philosophy and strong faith in bringing all refiners together, which endured even after others had given up the hope, is one indication of the broad intentions of the leaders, in spite of accusations to the contrary. The intense feeling engendered is shown by the fact that years after John D. Archbold had become part of Standard Oil he referred to the South Improvement Company as "an outrage on the business as a whole that was not included in it."[6]

Other general co-operative efforts to remedy the situation along the

lines of one function failed. The Petroleum Producers' Association, after its successful participation in the fight against the South Improvement Company, achieved only a limited measure of curtailment in production during the autumn of 1872. A voluntary Petroleum Refiners' Association, formed in August of that year and headed by John D. Rockefeller, attempted to negotiate all-inclusive contracts with the Producers' Association for purchase of crude oil, to allocate quotas among refiners and refining centers, and to control sales of finished products. The Producers' Association admitted defeat by January, 1873, the refiners five months later.[7] The sole gain of the latter was that the leading refiners acquired mutual respect and experience in working together.

During the next two years refiners and producers alike battled for profits against greater and greater obstacles. Seeking to keep swimming in the turbulent economic waters, producers expanded the scale of their operations; as a result average daily extraction of crude oil rose each year—from 15,800 barrels in 1871 to 29,937 in 1874—while the annual average price per barrel declined from $4.40 to $1.15, according to the Derrick's *Handbook.* Similarly, the monthly average wholesale price of kerosene in New York went from a low of 21.75 cents per gallon in 1872 to 10.75 cents in November, 1874, the lowest point of the depression years. Exports of petroleum products increased in volume, but the decline in prices caused a drop in total dollar value of the sales. Bankruptcies became common.[8]

While many refiners were closing down or failing, Rockefeller and his associates kept strengthening the position of Ohio Standard. During the years 1872 to 1874 they obtained reductions in rates from railroads. They sought assurance both of profits and of a steady supply of crude oil by building a new gathering system of pipelines under the name of the American Transfer Company and by joining Vandergrift & Forman and the New York Central–Lake Shore & Michigan Southern railroad system in the creation of the United Pipe Lines, a combination set up to combat the spectacularly growing facilities of The Empire Transportation Company. A contract in April, 1874, with the Erie gave that line 50 per cent of Ohio Standard's shipments in exchange for reduced rates and the lease of the Weehawken oil terminal in New Jersey. Ohio Standard expanded its plant in Cleveland and also bought up additional small refineries in Cleveland, Toledo, and western Pennsylvania, including Vandergrift's Imperial Oil Works. The Devoe Manufacturing Company, with its refining and canning facilities in the New York area, came into the Standard

Oil circle in 1873. Under the direction of H. A. Hutchins and William Rockefeller Ohio Standard began the extension of its marketing operations by building a group of bulk stations extending from the Middle West to New England and by purchasing a half-interest in Chess, Carley & Company (later Chess-Carley Company), the leading jobber south of the Ohio River and east of the Mississippi.[9]

Depressed conditions during 1874 induced pipeline operators and railroad men to resort again to co-operative effort. In August the New York Central, Pennsylvania, and Erie railroad systems, but not the Baltimore & Ohio, agreed to pool their traffic, including oil. In return for a commission, Standard Oil men and associated refiners were to administer the allocated flow of freight. Through a rebate system, all freight costs on both crude and refined oils to the seaboard were to be equalized with reference to five major refining areas—the Oil Regions, Pittsburgh, Cleveland, New York, and Philadelphia. Within less than a month all the leading pipeline companies and several small ones united in a pool to stabilize and regulate the flow of oil to railroad loading racks.

Under the same force of circumstances, in October, 1874, several outstanding oilmen decided to join the Standard Oil alliance. Charles Pratt, Henry H. Rogers, William G. Warden, Charles Lockhart, and William Frew agreed to bring their firms and facilities into alliance with Ohio Standard through exchange, between individuals, of stock in various companies. Harassed by depression, impressed by the accomplishments and integrity of Rockefeller and his associates, and assured equality of voice in management, the five men finally accepted the idea of joining the growing group of Standard Oil executives. Their alliance was not an association of corporations but a community of interest of a group of the leading stockholders and partners in a number of firms.

The agreement in the fall of 1874 spotlights several significant facts with regard to the early history of Standard Oil. The roots of the combination go down deep into the soil of at least seven areas, not merely in Cleveland. The leading refiners in New York, Philadelphia, and Pittsburgh joined the Cleveland oilmen in an alliance in which all formerly aggressively competitive executives worked as equals. The same idea was followed in connection with refiners in the Oil Regions, Baltimore, Maryland, and Parkersburg, West Virginia, during the next year, not to mention others later. The alliance of extremely individualistic former competitors on the basis of equality was a major factor in the adoption of a system of management for the whole enterprise by which

decisions were arrived at through consultation and agreement. Had the forces for unity not been so great and so generally felt, and had the affiliation with the alliance not been so voluntary, the group could not have become so inclusive. Had the system of management not given wide scope to the talents and ambitions of able men, the Standard Oil combination of owner-managers would have been neither so permanent nor so successful as it turned out to be.

These various agreements among the pipelines, railroads, and leading refiners were the necessary preliminaries to stabilization of refining and the ultimate attainment of dominance in that field by one group. Effective implementation of the agreements required several months of preparation.

Before the actual exchange of stocks took place in the spring of 1875, several occurrences led to modifications of planned procedures. In the opening months of the year the recent pooling agreements among the railroads were broken. The leading pipeline companies very soon made special contracts with favored railroads—United Pipe with the Erie and New York Central, the Empire with the Pennsylvania, and the Columbia Conduit (a trunk line from the producing area to Pittsburgh) with the Baltimore & Ohio. In March The Central Association, popularly known as The Central Refiners' Association, was formed under the presidency of John D. Rockefeller.[10] All refiners in five centers—Cleveland, Oil Regions, Pittsburgh, Philadelphia, and New York—were asked to join, and almost all did. Each member signed a contract delegating authority for buying and allocating crude oil supplies, effecting and allocating sales of finished products, and negotiating transportation agreements.

While The Central Association was being activated in 1875, other executives carried their firms into the Standard Oil alliance. John D. Archbold brought Porter, Moreland & Company with him and A. P. Bennett the partnership of Bennett, Warner & Company. Those two firms soon became the nucleus of the Acme Oil Company, a New York corporation utilized to buy or lease small plants in the Oil Regions, and later divided into two corporations domiciled in Pennsylvania and New York. Johnson N. Camden of Parkersburg, West Virginia, also joined the alliance and soon formed the Camden Consolidated Oil Company, which became the chief instrument for gaining an interest in refining units along the Baltimore & Ohio Railroad to the seaboard.[11] Exchange of stock again was the basis of admission of the newcomers to the Standard Oil family of firms.

During the summer Ohio Standard, acting in conjunction with all

members of The Central Association, agreed to serve as evener for oil traffic in a new railroad pool. This included the Baltimore & Ohio for the first time.

The executives of the new Standard Oil alliance proceeded to expand their dominance of refining during the years 1875 to 1877. They bought many plants, leased others, made quota arrangements with still others.[12] In 1877 the Baltimore United Oil Company was organized to hold various acquisitions in Baltimore, only the Canton Works there being left in the possession of Camden Consolidated. Among all the executives in the family, Pratt and Rogers had the least success: they effected only three sizable additions to the alliance in the New York area, though several small firms dealing in petroleum and its derivatives were bought out and the men brought into the alliance.

The lack of success in New York grew out of competition between railroads and between pipelines feeding oil to the railroads. Both United and Empire expanded their holdings. On March 15, 1877, the latter consolidated its pipeline properties into the Empire Pipe Company under the presidency of Joseph D. Potts. Thirteen days later the Standard Oil group created the United Pipe Lines, a corporation, to hold its properties in the United Pipe Lines and some of those previously owned by the American Transfer Company. Meanwhile, Joseph D. Potts and his associates had not only assured refiners in New York steady supplies of crude oil at favorable transportation rates but had also purchased or were constructing refining facilities for The Empire Transportation Company in Olean, Brooklyn, Philadelphia, and Jersey City. By expanding pipeline operations and entering refining the Empire was threatening the plans of Rockefeller and his associates.

The Standard Oil group declared open war on the Empire-Pennsylvania combination and won an unqualified victory. By October, 1877, the railroad group succumbed and sold its tank cars, pipelines, loading facilities, and refineries to the now gigantic oil combination. During the campaign Standard Oil men also purchased the Columbia Conduit Company, the first trunk pipeline built in the world. A new pooling arrangement of the four railroad trunk lines kept the Standard Oil group as evener, but the Pennsylvania executives were never more than wary allies of the oilmen after 1877.

Reluctant association on the part of the Pennsylvania was the least of Standard Oil's worries for the next few years. By eliminating the last strong competitor in gathering oil, Rockefeller and his associates aroused

uncompromising opposition among a strong group of oilmen, particularly producers in the Oil Regions. They rose to attack the Standard Oil alliance on many fronts. Simultaneously, an unprecedented flood of crude oil from the giant Bradford field, opened in 1875 and developed in ensuing years, resulted both in tremendous losses of oil and in a downward movement in price of crude. Producers blamed the Standard Oil "monopoly" for the situation. By the end of 1878 opponents had initiated equity and criminal suits involving both executives and corporations in the combination. Several small competing gathering lines were constructed. During 1878-1879 another group of men organized The Tide-Water Pipe Company, Limited,[13] and built the first trunk pipeline over the mountains; the pipe reached the Philadelphia & Reading Railroad at Williamsport, Pennsylvania, thereby breaking the near-monopoly of Standard Oil in gathering oil and the dominance of the railroads in transporting petroleum to seaboard.

The Standard Oil defense was positive action at every point of attack. United Pipe Lines field men sought to discourage construction of competing gathering lines by attempting to lay pipe to every well and by constructing storage tanks at unprecedented speed. When tankage failed to keep pace with production of oil, early in 1879 United Pipe announced "immediate shipment"—a limitation of acceptance of oil for storage and sales of excess oil for whatever it would bring. Antagonized by this apparently "arbitrary" action, many producers were openly outraged by the fact that Standard Oil buyers were among those to take advantage of the opportunity to buy oil at distress prices. The pipeline men later reminded critics that the policy was short-lived, that "immediate shipment" was the only way of meeting a flood of oil beyond their building capacity, that Standard Oil was only one of many buyers of excess oil, and that United Pipe publicly offered fifteen cents per barrel to any shipper who would relieve the pressure on the pipelines.[14] Standard Oil executives agreed to stand by the railroads in a price war with Tide-Water's pipeline but soon abandoned that position by starting to build a trunk pipeline system to all major refining centers of the alliance, a policy under consideration as early as 1877 at least.[15] The range of tactics employed by Rockefeller and his associates in the struggle with Tide-Water is discussed in Chapter 4.

Meanwhile, the legal fight with the producers was characterized by delays until an out-of-court compromise agreement was made in February, 1880. It provided for guaranteed acceptance by United Pipe of

65,000 barrels of crude oil daily and assurance that Standard Oil agents would not buy any "immediate shipment" oil at prices lower than those prevailing on the petroleum exchanges, if no one else did. For the next fifteen years the price of Pennsylvania-grade crude oil was determined by the tremendous speculative activities on the oil exchanges, not by the largest buyer of crude oil for refining—Standard Oil. Units of the alliance also pledged themselves that they would make "no opposition to an entire abrogation of the system of rebates, drawbacks and secret rates of freight in the transportation of petroleum," and that they would not receive any rebates or drawbacks that the railroad companies were "not at liberty to give to other shippers of petroleum."[16] Public announcement of these terms did not fully allay suspicions aroused by the revelations about Standard Oil in the courts, including the case instituted by a rival firm in Cleveland, Scofield, Shurmer & Teagle, in 1880, and in legislative investigations held in Ohio and New York during the previous year.

During the years 1877-1881, the period of open combat between Standard Oil and its opponents, Rockefeller and his associates added several more firms and executives to the alliance. Standard Oil men, through lease or purchase, brought into their combination numerous dealers and refiners in the Oil Regions, Pittsburgh, and New York. Incidental to acquisition of pipelines in McKean County, Pennsylvania, and the nucleus of the later Jersey Standard refinery at Bayonne, in 1877 the members of the alliance took possession of small producing properties owned by the Producers' Consolidated Land & Petroleum Company. This was the largest of four producing units purchased.[17] After 1877 Standard Oil managers bought shares in lubricating oil and specialty firms, notably in Vacuum Oil Company of Rochester, Thompson & Bedford Company, Limited, Swan & Finch, and the Chesebrough Manufacturing Company, Consolidated, all in New York, and Galena Oil Works, Limited, Signal Oil Works, Limited, and Eclipse Lubricating Oil Company, Limited, of Franklin, Pennsylvania. In 1878 participation was also achieved in two additional new marketing corporations—the Waters-Pierce Oil Company (formerly H. C. Pierce & Company) of St. Louis and the Consolidated Tank Line Company of Cincinnati.

During 1881, on the basis of a comprehensive charter, the National Transit Company was formed to own the Standard Oil trunk pipelines and shares in the United Pipe Lines and to bring in some erstwhile violent competitors—Joseph D. Potts and his associates. Their contribution encompassed the passenger-tank steamer *Vaderland*, a few short pipelines,

an oil terminal at Communipaw (Jersey City) vested in the National Storage Company, and near-by refinery construction which later became the Eagle Works of Jersey Standard. Potts became an active director of National Transit after refusing the presidency.[18] The formation of National Transit forwarded the systematization of pipeline construction and operation, but the administration of other functions was not yet so effectively organized.

The legal method of participation in the ownership of various firms in 1881 emphasized the loose character of the alliance. It was a community of interest of two score investors. Until April, 1879, the shares of all participants in companies and partnerships outside the state of Ohio had been held in trust for the common body of stockholders by individuals, Flagler being the most prominent. In that year, after a survey of their holdings, Standard Oil executives decided to put almost all shares except those in Ohio Standard, the leading company in the group, in the hands of three of its employees as trustees—George H. Vilas, Myron R. Keith, and George F. Chester. Within two years the acquisition of additional properties had again emphasized the need for unification of holdings and of management. To that situation Standard Oil executives responded with a more effective organization, discussed in Chapter 3.

By 1881 the Standard Oil alliance had brought into its fold a large segment of the American petroleum industry. Within that industry, previously characterized by excessive competition and harassed by depressed conditions, Rockefeller and his associates had created a giant combination. Beginning in 1872-1873 they had proceeded simultaneously to enhance their shareholdings in firms owning gathering lines, refineries, and domestic marketing facilities. Standard Oil had dominance in gathering and refining petroleum, but the influence of the alliance in marketing was distinctly limited, in producing was relatively slight, and in trunk pipelines was only beginning. This general situation of the Standard Oil group of companies on the eve of the birth of Jersey Standard was the result, by and large, of the policies pursued by the team of men who had formed the combination.

Chapter 2

The Standard Oil Team and Its Early Policies

As an early corporate product of the Standard Oil combination, Jersey Standard fell heir to the policies and practices of the men who created the alliance. In the course of working together before 1882, this group of executives had set precedents for the management of the Standard Oil family of firms which were to influence vitally the life of the new company.

THE MEN WHO MADE STANDARD OIL

The Standard Oil alliance in 1881 was the creation of a team of men.[1] As one man paraphrased John D. Rockefeller's own statement, the "secret of the success of the Standard Oil Company was that there had come together a body of men who from beginning to end worked in single-minded co-operation, who all believed in each other and had perfect confidence in the integrity of each other, who reached all their decisions after fair consideration with magnanimity toward each other" in order to assure "absolute harmony."[2]

As an instrument for carrying out the ideas of those men, the combination necessarily took its character from those who made it and managed it. When they chose to create a new corporation, such as Jersey Standard, it became part of the mechanism for pursuing their policies. Extremely significant, therefore, for understanding the history of the company is acquaintance with the individuals who created and directed both the Standard Oil family of companies and the Jersey Company itself. Scores of men made material contributions to the early development of the combination but only a relatively few ranked as outstanding.

John D. Rockefeller (1839-1937) was captain of the team. By all odds the largest holder of shares, he probably would have been chosen the head for that reason alone. Although not the only person to have the conviction in the 1870's that the petroleum industry should be stabilized, he first formulated the idea that the only satisfactory means was to

organize a commonly owned unit on a national scale. Allan Nevins has characterized Rockefeller as careful, patient, cautious, methodical, quick to observe and to learn, grave, pious, aloof, secretive, reticent, inscrutable, and taciturn. Rockefeller considered work a duty, loved simplicity, believed in discipline, and possessed little social warmth except with his family and intimate friends. He had a mind of extraordinary force, great power of concentration, and almost infinite capacity for detail. Although he was willing to make decisions and to act forcefully, he possessed not only remarkable foresight, broad vision, and cool judgment, but also willingness to consider the ideas of others.

In the early 1870's Rockefeller began to delegate most details of management to subordinates and thereafter devoted himself primarily to formulation of broad policy. His greatest contribution, beyond the concept of the Standard Oil combination itself, was the persuasion of strong men to join the alliance and to work together effectively in its management. The remarkable fact was that Rockefeller, while still in his thirties, impressed a group of men, almost all older than himself, with his qualities of leadership. His most arduous task later was to preside over meetings of strongly individualistic, positive executives, while they discussed and determined, usually unanimously, strategy and tactics for the combination as a whole.

During the 1860's and 1870's the closest and strongest associate of John D. Rockefeller was Henry M. Flagler (1830-1913).[3] Of average height, slight build, erect figure, unobtrusive and dignified manner, Flagler was an ambitious, patient, and shrewd man of business. It is difficult to determine where the ideas of Rockefeller stop and those of Flagler begin. They were warm personal friends; they talked over their business before, during, and after office hours. Flagler liked to build new things and possessed a faculty for reducing complex problems to their simplest components. His constructive imagination was as broad and as vivid as Rockefeller's. It was caught by a desire to develop Florida, and into its hotels, railroads, and other enterprises he put some $50,000,000, and more of his energy than into Standard Oil, during the 1880's and later. Yet he left his mark on the combination. Having an aptitude for legal affairs, he was a master in drawing up clear, concise contracts. The incorporation of Ohio Standard appears to have been his brain child, and he helped in the later organization of the Trust. Flagler also participated in many negotiations leading to entry of other firms into the Standard Oil family. His special function was the handling of all affairs concerning transportation of both

raw materials and finished products, and he drove hard bargains with railroad managers. Gifted with a keen sense of humor and a feeling of personal responsibility to employees, he won the warm respect and loyal support of most subordinates. Not the least important of Flagler's executive positions was the presidency of Jersey Standard during eight of its first seventeen years.

William Rockefeller (1841-1922) was an organizer, a financier, and a marketer. Some of his selling was done in domestic trade east of Ohio, but after 1865 he was the expert in sales for export. Since these accounted later for more than half of the kerosene sales of the combination, they played a dramatic role in its growth, particularly in that of such specialists in manufacturing for export as Jersey Standard. William Rockefeller was also instrumental in persuading Charles Pratt, H. H. Rogers, and other New Yorkers to join the Standard Oil family. From the middle seventies he was the chief representative of the group in all dealings with New York banks and helped to acquire the short-term capital needed during the early days of the combination's development. As significant as any other of William's efforts was his creation of an efficient administrative staff in New York prior to 1882. At that date he became president of the Standard Oil Company of New York, whose central position in the development of the combination will be discussed later. Unwilling to limit his interests to Standard Oil, William collaborated with James Stillman of the National City Bank and H. H. Rogers in promotional and speculative activities in copper, railroads, and gas companies. Less pious than his older brother, more lavish in his living and less in his giving, William also amassed a smaller fortune and has been somewhat overshadowed by John. It is certain that William was an able organizer, that his joviality and good humor made him both an excellent marketer and warmly liked by his fellow workers, and that the history of Standard Oil would have been vastly different without his activities.

While the Standard Oil group was being formed, Oliver H. Payne (1839-1917) was one of the leading figures in the organization. Wealthy by birth, and one of the few, if not the only one, in the early top management of Standard Oil to have attended college, Payne had an excellent record in the Union Army before becoming a refiner in 1864. Ambitious and able, he and his partners built Clark, Payne & Company into Ohio Standard's most formidable Cleveland competitor before the former was merged in the latter in 1872. Then, as a member of the executive committee of Ohio Standard, he participated in all its important decisions.

Payne was a firm believer in the unification of the American petroleum industry under the banner of Standard Oil and worked hard to reach that goal. He became one of the nine top executives of the combination in 1882. Much later, he served as director of Jersey Standard, but by that time his early activity in oil had been superseded by heavy involvements in the development of the American Tobacco Company and other enterprises.

Jabez Abel Bostwick (1830-1892) entered the Standard Oil group at the same time as his friend Payne and was one of the leading figures in the combination for fourteen years. Bostwick had a varied early experience as clerk and accountant in banking and commission mercantile houses located in Covington (Kentucky), Cleveland, and Cincinnati before becoming a partner in Bostwick & Tilford, cotton factors. Domiciled in New York by 1864, that firm gradually became a specialist in petroleum. By 1871 it bought and sold both crude oil and refined products on commission for others and on its own account, leased and operated an oil yard, managed a refinery, ran a canning and casing plant, and owned barges and lighters. Within Standard Oil, J. A. Bostwick & Company, as the firm was known after January 1, 1872, continued to carry on these functions, including the purchase of almost all the crude oil consumed by refineries in the combination after 1879. Characterized as "strict almost to sternness in his dealings, preferring justice to sentiment in business,"[4] Bostwick retired from active participation in Standard Oil affairs to assume the presidency of the New York & New England Railroad in 1885.

One of the most influential men in the Standard Oil combination from 1874 to his death was Charles Pratt (1830-1891). Below medium height, with a pointed face adorned by a goatee, he possessed a large amount of nervous energy and a quiet confidence in his own ability as a refiner and marketer. Fair in his dealings with others, modestly reserved, unable to express himself easily in speech, he nevertheless "always knew what he wanted and what was needed," as one of his protégés later reminisced.[5] When he felt strongly on a subject, he could and did write pointed memoranda. Following early mercantile training and six years of participation in the partnership of Raynolds, Devoe & Pratt, manufacturers of paints and oils, Pratt devoted his attention to refining and marketing petroleum after 1864. Specializing in high-quality kerosene widely advertised as Astral Oil—"It will not explode"—he built up a substantial market for his products at home and for export. After 1874, besides managing his own

refining and selling operations, serving on the advisory and executive committees of Ohio Standard, and sharing with William Rockefeller and Bostwick the responsibility for directing all Standard Oil activities in New York, he aided in the combination's expansion in Pennsylvania, New York, and New England. He was a match for John D. Rockefeller in his attention to detail, avoidance of waste, and ability to choose and train able assistants and successors.

William Gray Warden (1831-1895) was almost the opposite of Charles Pratt in physique and temperament. A large man with mustaches and sideburns, Warden was genial, volatile, exuberant, and optimistic. Inventive by inclination, he patented apparatus and a process for distilling petroleum in 1871, not to mention an improved cylindrical tank car with dome a year later. He was also thoughtful, willing to speculate about new ideas, and bold enough to suggest their application much ahead of their time; in fact, some of his ideas, mentioned later, might startle a board of directors today. He was as ardently expansionist in business as he was abolitionist on the slavery issue. Warden played a prominent part in bringing properties from the Delaware River to the Allegheny into the Standard Oil combination. While active in managing Standard Oil interests in Pennsylvania, he became a director of Ohio Standard in the 1870's, a member of its executive committee, and in 1882 one of the nine top managers of all Standard Oil operations. About the middle eighties, however, he became preoccupied with the United Gas Improvement Company and Philadelphia real estate and dropped out of the top rank of oil executives.[6]

Among others on the highest echelon of executives, conservative Benjamin Brewster (1828-1897) often acted as a brake upon the enthusiasms of Warden and other bold members of the group. Brewster, a "forty-niner," made the nucleus of his fortune in California as a partner in a mercantile business with Oliver Burr Jennings, the first New York investor in Ohio Standard. Though Jennings was never active in management of the combination, Brewster aided in creating and managing it from 1872 until his retirement. Expert and cautious in financial affairs, he was chief representative of the pipelines among top executives of the combination until 1888. Brewster was also an officer and investor in several railway enterprises, including the Rock Island, Keokuk & Des Moines, and New York Elevated lines.[7]

Among the men who energetically engaged in the creation of the Standard Oil alliance during the pioneering days were several whose

later contributions diminished so appreciably that their earlier roles might easily be overlooked. Samuel Andrews, the first general manager of Ohio Standard's refining, sold out his interests after a disagreement over policy in 1878. W. C. Andrews, who came to the Ohio Company with the purchase of Westlake, Hutchins & Company in 1872, was exceedingly active during the acquisitive seventies but early turned almost all his attention to utilities in Cleveland. Two other men—Charles Lockhart and J. J. Vandergrift—were not only leaders in the expansion program but remained in the Standard Oil organization for many years in nominal administrative posts and in actual advisory capacities.

Charles Lockhart (1818-1905) ranked as the oldest and one of the more conservative among early leaders of the Standard Oil alliance. He began dealing in petroleum in 1853 and continued to do so through a variety of partnerships during his active business life. With William Phillips and William Frew[8] he was one of the early emulators of E. L. Drake in drilling for oil. Lockhart & Frew's refinery began operations in 1861 after Lockhart had personally visited Europe to promote sales. Though an energetic director of Ohio Standard from 1876 to 1881, he did not play so prominent a part thereafter in the management of the combination. He served as president of The Atlantic Refining Company in the seventies and as president of the Standard Oil Company (Pennsylvania) from 1874 to 1892. His sound, cautious advice was often sought, but after 1881 most of his attention was given to his investments in iron and glass manufacturing, timberlands, mining, wheat farming, banking, and transatlantic steamship lines.

Although also won away by attention to other investments at an early date, Jacob Jay Vandergrift (1827-1899) played an important part in setting the pattern for Standard Oil before 1882. Experienced as a producer, dealer in crude, transporter, and refiner of petroleum, he brought many skills to his directorship of Ohio Standard from 1875 to 1881. He energetically participated in expanding the combination's operations in the Oil Regions and in managing the Imperial Refining Company, Limited, there. His greatest contribution to Standard Oil fortunes was the building of the United Pipe Lines into the pre-eminent gathering system in the United States.[9] He retained the presidency of that organization as long as it existed, but from the early eighties his interests ranged outside Standard Oil into iron and steel manufacture, fabrication of washing machines, banking, and real estate. Short, stout, and energetic, he was

quick to make decisions and highly regarded for his benevolent consideration of employees and his straightforward dealings.

In contrast to the declining influence of Lockhart and Vandergrift, that of Henry Huttleston Rogers (1840-1909) was to rise rapidly in the 1880's. After early labors in his father's grocery store at Fairhaven, Massachusetts, and on the Old Colony Railroad, he and a boyhood friend built and ran a refinery in the Oil Regions from 1861 to 1867. During those years Rogers reportedly perfected a still which was adopted, with some modifications, by refiners all over the United States. He went with the Pennsylvania Salt Works at Natrona for a year and there developed an inexpensive process for using bicarbonate of soda in making sulphuric acid, a prime requisite for treating petroleum products. In 1868 he joined Charles Pratt's firm in New York and within three years patented an improved apparatus for more accurately separating naphtha fractions from kerosene and for dividing naphtha into its component parts. As a leading figure among refiners in Standard Oil, he was chosen chairman of the committee of experts on manufacturing when it was formed in 1881. Not only a refiner but a seller, negotiator, and organizer, Rogers stepped up to the top rank of Standard Oil managers in the mid-eighties and soon became the leading executive representative of all pipeline activities in the combination. All these responsibilities failed to prevent his extensive speculation and participation in gas, copper, steel, and other enterprises. To his friends and associates Rogers appeared a kind, true, and loyal friend, an able administrator, an "indomitable" worker of "keen" intelligence, iron will, "unbounded courage," "magnetic" personality, and genial charm. While conceding these attributes to the many-sided man, critics characterized him as speculative, power-hungry, ruthlessly severe in business dealings, arrogant, and needlessly quick to anger—all concealed normally beneath a suave manner and fine social graces.[10]

The youngest man among the early leaders of the Standard Oil alliance was John D. Archbold (1848-1916). He went to Titusville in 1864 to begin his career there as a clerk for W. H. Abbott, a buyer and seller of petroleum. Within three years Archbold was a partner in W. H. Abbott & Company and entered refining in 1869 as a member of Porter, Moreland & Company. During the early seventies he acted as sales agent in New York for several refineries in the Oil Regions and negotiated their rate agreements with railroads on shipments to him. After 1875 Archbold handled the expansion of the Acme Oil Company, and with Frank Quarles Barstow, almost an alter ego, managed its manufacturing and marketing

activities in Pennsylvania and New York. Archbold became a director of Ohio Standard in 1879. From experience he knew every function in the oil business and it was no accident that he succeeded John D. Rockefeller in the middle nineties as the acting head of the world-wide enterprise of Standard Oil. More than any of the other early top executives, Archbold devoted his entire business life to the organization. Medium in height, boyish of face, mercurial and jovial in disposition, he was quick to make decisions and aggressive in developing plans. He had unusual ability to adapt the ideas of others to the ends of the organization, an administrative attribute which endeared him to associates and subordinates alike and induced them to work together effectively.[11]

Although never an executive, one other man colored the history of Standard Oil as much as many of the men who created and managed the combination. Samuel C. T. Dodd (1836-1907), the general solicitor of the organization from 1881 to 1905, began his practice at Franklin, Pennsylvania, in 1859. Short and rotund, affable and learned, he soon became expert in the legal technicalities of the petroleum business. A Democrat in politics, he actively participated in the Pennsylvania constitutional convention of 1872. Though Dodd thought the material prosperity of the United States was attributable "in a great measure" to large combinations of capital, he was equally convinced that they should be regulated by clearly framed laws. Outspokenly opposed to "unjust" railroad rate discriminations, he accepted the invitation to become counsel for Standard Oil in the Oil Regions in 1879 only on the condition that his employers fully recognize his determination to fight the practice of rebating. When Dodd, a Presbyterian elder, abandoned private practice to become general solicitor for Standard Oil in New York, he humorously explained his decision to become the "least victim of the monopoly" by remarking: "Well, as the ministers say when they get a call to a higher salary, it seems to be the Lord's will."[12] Thereafter Dodd quietly and honestly told top managers what they could and could not do under existing law as he interpreted it and occasionally, as extant correspondence shows, advocated a course of action on moral rather than legal grounds. He had a most difficult assignment in charting a course for a large business in a period when a new public policy toward trusts and combinations was emerging.

The executives advised by Dodd were men of varied abilities and complementary qualities. While several of them had specialized at one time or another in separate functions of the petroleum industry, a num-

ber of them had broad experience over a number of years. Some were inventors. Others brought special aptitudes in organization and marketing. Almost all had begun their careers in mercantile enterprises. Before joining the Standard Oil alliance, all had engaged in either regional or national co-operative efforts. By 1882 they had worked together for a number of years; while differing in backgrounds and philosophies, they had evolved policies which were, with some modifications, to guide the Standard Oil combination throughout its early history and to affect the petroleum industry for a longer span of years.

POLICIES, PRACTICES, AND PRECEDENTS

Policies and practices pursued by Standard Oil executives during the years prior to 1882 emerged in a variety of ways. Some policies were evidenced by votes of directors of components of the alliance and gradually won more general acceptance among its members. In other instances precedents and practices developed into policies over time; no formalized statement ever indicated the direction in which the leaders were traveling, but in a succession of separate steps they evolved a significant behavior pattern.

Many of the concepts and procedures adopted by executives of the alliance stemmed from their early experience as small businessmen. Probably at no other time during the nineteenth century was economic activity more freely competitive than in the period from 1840 to 1865. The customs and mores of the small individual enterpriser became the accepted pattern for almost all men. Naturally enough, therefore, Rockefeller and his associates learned in their youth to believe in freedom of entry into any occupation, in the sanctity of private property, in the obligation of the owner to manage his own operations, and in the right to keep his business affairs secret, a concept dating from time immemorial. As a corollary of that idea, in courts or legislative investigative chambers a businessman testified to the legal truth, and no more, a practice still honored by general observance in spite of critical charges of evasiveness and ambiguity. Since most markets were local, every businessman could observe his competitors with relative ease, and did. His habit was to use any competitive device not clearly prohibited by law. Bargaining in the market place was almost universal, whether for products or for such services as the transportation of freight. Posted prices were a point of departure for haggling, and price reductions were the most widely utilized of competitive techniques.

In response to the chaotic and depressed years of the 1870's, however, Standard Oil men drastically modified some of their socially inherited concepts about competition. They apparently desired at first to bring all gatherers of crude oil and refiners of light petroleum fractions into one commonly owned unit—to create a monopoly. Late in the decade they added lubricating oil specialists and trunk pipelines to their list of components to be unified. By means of common ownership in an association of specializing firms, Rockefeller and his associates created a great horizontal and vertical combination, which, on the eve of the birth of Jersey Standard, maintained overwhelming dominance in gathering, storing, and processing petroleum and its derivatives.

Either by design or through pressure of circumstances, the Standard Oil group of executives had not achieved monopoly in any function by 1881. Strong minority interests in many domestic marketing companies within the alliance, and limited coverage of the market by them, set definite limits to the influence of top managers in that field of operations. In almost all sales for export foreign merchants bought oil from companies in the Standard Oil family and carried on marketing in foreign lands. The combination owned few producing properties. United Pipe Lines men failed to keep pace with expansion in Bradford production, and competing gathering and storing facilities kept appearing. Tide-Water Pipe had thrown the first trunk pipeline over the mountains toward the sea and remained a belligerent competitor. Under the agreement with the producers in 1880 the price of crude oil was set on the oil exchanges, not by Standard Oil. In manufacturing, the area of initial intent for monopoly, the top managers of the alliance had stopped short of their goal. They had refused to pay the prices asked by owners of some plants. Others had sprung up in response to inducements offered by the Pennsylvania Railroad, and in 1882 the editor of *Mineral Resources* noted that the combination had "for some reason" not renewed leases on a number of refineries, several of which were doing "a good trade" and "assuming considerable importance."[13] Thus, by that year some of the firms classified by H. H. Rogers in 1879 as being "in harmony" with Standard Oil had gone their independent ways.

Standard Oil executives employed a variety of tactics in carrying out the expansionist program during the 1870's. After the consolidation in Cleveland and the disastrous South Improvement episode, Rockefeller and his associates first won the confidence of competitors through comprehensive voluntary association. They then brought into the alliance the

strongest men and firms in specific areas or functions, a policy pursued, with some exceptions, until 1911. Exchange of stock in the different companies by individuals and guarantee of equality in management provided the final assurance needed to convince such strong individualists as Lockhart, Warden, Pratt, and Rogers that combination was to their advantage. All then co-operated eagerly in trying to unify the remaining firms in refining by bringing them into The Central Association, by buying plants whenever feasible, and by leasing other works. If a seller personally chose not to enter the combination, he usually signed an agreement not to engage in the petroleum business for a period of years. In any case, evidence in extant records substantiates the point that Standard Oil men completely and carefully inventoried all properties and paid "good," though not high, prices for them, including compensation for patents, trade-marks, brands, good-will, and volume of business. In many instances prices for properties reflected the desire of Standard Oil officials to enlist the inventive capacities or administrative abilities of the owners in the service of the alliance.[14] The preponderance of the evidence indicates that Rockefeller and his fellow executives preferred to buy out rather than fight out competitors.

At the same time, when Standard Oil men felt it necessary to apply pressure as a means of persuading a rival to lease or sell his plant, they showed no hesitancy in utilizing the usual sharp competitive practices prevailing in the oil industry during the 1870's. On one occasion or another they pre-empted all available staves and barrels, restricted as completely as possible the available tank cars to their own business, and indulged in local price cutting. They meticulously watched and checked on competitive shipments and sales, sometimes in co-operation with railroad men, and diligently negotiated advantageous freight rates on railways, even to the point of receiving rebates or drawbacks on rivals' shipments. All acts were kept secret as long as possible. The size and resources of the alliance gave it overwhelming power, which was sometimes used ruthlessly, though it is worthy of note that numerous oilmen successfully resisted the pressure.

Within the alliance itself executives also retained many of their competitive habits. Although price competition almost completely disappeared within the combination,[15] men and firms raced with each other in reducing costs, devising new techniques, developing products, improving their quality, and showing profits. Top managers believed in competition but not in the undisciplined variety.

In building the alliance the leaders of Standard Oil adopted a long-range view with emphasis on planning, even before they had achieved an organization to carry such an approach into successful operation. They showed a profound faith in the permanence of the industry, a belief not generally held in years when the petroleum business was characterized by instability, rapid exhaustion of producing fields, and doubts about the appearance of new ones. They wanted to plan and to have reasonable assurance that they were taking no more than calculated risks in pushing toward their objectives. A necessary requirement of planning was centralized policy formulation.

That responsibility devolved not upon one man but on a group of executives. The evolution of Standard Oil's committee system, the hallmark of its administrative methods, started early in the seventies. The original bylaws of Ohio Standard provided for an Executive Committee. Its first membership of two, John D. Rockefeller and Flagler, was increased to three during the consecutive terms of Samuel Andrews and O. H. Payne. Archbold replaced the latter in 1879. William Rockefeller, Pratt, Warden, and Bostwick had joined the three Cleveland members the previous year. At that time the Executive Committee absorbed the "Advisory Committee," which had been established as early as 1873 to act in the New York area. William Rockefeller and Bostwick, its first members, had been joined by Pratt and Warden soon after they entered the alliance. The enlarged Executive Committee of 1878 held many of its almost daily meetings at 140 Pearl Street, New York, and two years later made four a quorum because of the geographic split in membership between Cleveland and New York. Members of other committees, to be discussed in the next chapter, started consultations before 1882. If the making of decisions as a synthesis of opinion of a group after discussion is a characteristic of modern business, as a recent commentator has implied, then Standard Oil was modern in the 1870's.[16]

In order to have easily available the best data and advice for making decisions, the Rockefellers and their associates built up staffs in Cleveland, New York, and other points. For the use of executives they collected, evaluated, and digested information on crude oil supplies, costs of manufacture, and markets all over the world. The practice of watching and reporting on marketing by competitors everywhere in the United States, not merely locally, was already inaugurated, though not yet systematized. S. C. T. Dodd was engaged as legal navigator; Standard Oil officials

desired to operate within the law. A beginning was made in standardizing accounting procedures.

As the emergence of the Executive Committee and the formation of staffs indicated, the creation of the combination permitted a division of labor or specialization within the organization. As Archbold expressed the development in 1888, the grouping of talents within the alliance permitted "various individuals to take up the different features of the business as a specialty and accomplish greater efficiency than can possibly be accomplished by an individual who attempts to cover all in a business."[17]

In the matter of finance, as in other aspects of operations, Ohio Standard set precedents on reporting and central review. In 1877 the directors of that company resolved that all persons responsible for different aspects of the business should make quarterly reports in writing to the board. Two years later, its members unanimously agreed that annual financial statements should be presented. In 1875 the directors had voted that expenditures for new construction in manufacturing exceeding $2,500 should be undertaken only with written consent of seven members of the board, but that resolution was repealed five years later and the company's Executive Committee was given full charge of all matters relating to repairs and new construction.[18]

Since the goal of the members of the alliance was to maximize profits in the long run, they adopted practices to that end. Emphasis was placed on reducing costs, improving and standardizing the quality of products, and striving for new methods of refining, including the engaging of specialists. Stories about John D. Rockefeller's penchant for eliminating waste and effecting economies have been told and retold. As president of the Acme Oil Company in the Oil Regions, Archbold achieved substantial savings through buying supplies in quantity and by making annual contracts regarding the repairing of boilers and barrels for all plants under his jurisdiction. When he purchased a lubricating oil patent in 1879, Archbold guaranteed the owner, Eli E. Hendrick, a salary of $10,000 per year for ten years in return for the devotion of his inventive talents to Acme.[19] Duplicating pipelines were removed, inefficient plants dismantled, strategically located refineries enlarged, and auxiliary manufacturing units developed, all in the name of economy and reduction of costs. By consistently stressing that practice in every function Standard Oil men moved gradually but inevitably toward mass manufacturing and, more slowly, toward mass marketing.

Gathering information, consultation, planning, and experimentation did not always lead to quick action, but the leaders of Standard Oil early indicated flexibility in adopting new methods and thoroughness in carrying them out. Critics voiced the opinion in the late 1870's that Standard Oil, having invested so much in refineries in the Oil Regions, could not take advantage of the pipeline revolution to establish large manufacturing units at the coast.[20] Almost as soon as others had demonstrated the feasibility of building long trunk pipelines the Standard Oil group took action in 1879. It already possessed a system of gathering lines through the United Pipe Lines. After its organization in 1881, the National Transit Company pushed trunk pipeline building vigorously. By the next year it owned 1,062 miles of trunk lines, only 48 of which had been bought from firms outside the alliance. Its policies, enlarged upon in later chapters, illustrate the fact that Standard Oil was not always the earliest to initiate an innovation, but, once launched on a policy, the combination pushed it with a vigor and fervor made possible by efficient organization and ample financial resources.

Standard Oil's financial policy itself was an important element in the successful life of the combination and its components. Not only were the risks spread by the breadth of the alliance's activities, but profits made in one company or phase of the business flowed into development of another when desired. Early in the history of Standard Oil units short-term loans were often obtained from commercial banks, and temporary aid had to be obtained when the properties of The Empire Transportation Company were purchased. A conservative ratio of dividends to net income, however, was soon to permit the accumulation of funds for self-financing.

Ohio Standard furnished an example for the companies in the alliance on the matter of insurance against fire. On the assumption that loss by fire was a normal expense of the petroleum industry and could be carried by a large unit, the directors of the Ohio Company agreed in January, 1877, to insure property in any one place only on the excess of its valuation above $100,000.[21]

As directors of The Standard Oil Company (Ohio), executives of the alliance also set a precedent regarding the ownership of producing properties. In April, 1878, apparently as a result of a suit by H. L. Taylor & Company against John D. Rockefeller and others for breach of contract in a joint producing operation, the directors unanimously voted not to invest any more money in the purchase of crude oil lands. Six months later they resolved to discontinue all activity in producing petroleum and

instructed the Executive Committee to dispose of its properties.[22] This point of view had an influence upon the Standard Oil alliance for a decade.

Quite the contrary was the action adopted in regard to pipelines. By 1881 the Standard Oil group was definitely launched on a program for large-scale expansion of its pipeline facilities and soon exercised a greater measure of control over the function. The combination poured an increasing quantity of capital into building lines; the profits from them provided a cushion for all operations of the alliance. The speculatively minded can ask whether the development of the oil industry would have been more rapid or socially beneficial had parallel pipelines competed with each other during the formative years of the industry, and whether the development would have been as efficient, or more so, had the railroad systems controlled competing lines, as had seemed possible in the 1870's. The point remains that the top managers of Standard Oil determined to keep this function in their own hands to the extent possible; the measure of success achieved is discussed later.

The roots of Standard Oil's policies went deep into the personalities and early experiences of Rockefeller and his associates. Though few of their practices had been satisfactorily systematized by 1881, precedents had been established for many later policies of Jersey Standard and other members of the combination.

By the end of 1881 the general public was hard put to make an accurate estimate of Standard Oil's behavior. Legislative investigations and several legal cases had already elicited an enormous amount of conflicting testimony as to the relations of the combination with both railroads and competitors. Rockefeller and his associates had heightened uncertainty and speculation about their activities by their secrecy in building the alliance and by their evasive, often ambiguous, consistently legally accurate testimony on the witness stand. The very newness, size, dominance, and efficiency of the combination, not to mention its absorption of small competitors in adversity and its avid search for the lowest possible railroad rates, all tended to arouse antagonism. In 1882 S. H. Stowell closed his comments on Standard Oil in *Mineral Resources* with an unbiased observer's puzzlement: "There seems to be little doubt that the company has done a great work, and that through its instrumentality oil refining has been reduced to a business, and transportation has been greatly

simplified; but as to how much evil has been mixed with this good, it is not practicable to make a definite statement."[23] It was certain that through combination managers of Standard Oil had brought a measure of order to a formerly confused industry, though they thought that the administration of the alliance itself needed further systematization.

Chapter 3

The Pattern of Standard Oil Organization 1882-1892

TO CARRY out the policies initiated in the previous decade, executives of the Standard Oil alliance in 1881 embarked upon the establishment of a systematic administration of their numerous firms. In the process of pursuing that goal they introduced a new unifying instrument, the Trust, which soon gave birth to new Standard Oil companies in New Jersey and New York. Simultaneously plans were laid for centralizing top management in a New York office. By 1886 the functioning organizational pattern of the Standard Oil combination was set for the next twenty-five years, during the last twelve of which the Standard Oil Company (New Jersey) was the parent corporation. More important than any of these moves was the fact that a group of vigorous executives developed for the first time in American history an effective system of working co-operatively to manage a large integrated business enterprise producing goods for a wide market. The men evolved a system which, though ever changing with leaders and events, was intended to maintain a balance between centralized formulation of policy and local autonomy in field operations—an ideal still prominent in the thinking of Jersey Standard managers.

FORMING THE TRUST

As early as 1880 John D. Rockefeller and his associates clearly saw several weaknesses in the management of their business. One was the lack of adequate central authority. As John D. Archbold later phrased the idea, at "about that time there began to be felt the necessity of a more thorough unification of the interests."[1] Authorization for central management of the whole combination was specifically vested in no individual or group of individuals among the stockholders. To be sure, the ultimate power to administer the associated companies rested in five men—the two Rockefellers, Flagler, Harkness, and Payne—who together owned approximately four-sevenths of the securities of the various

business units in the alliance. But policies and decisions were necessarily based upon consultation and agreement among more than a score of managers, not alone upon the wishes of those dominant financially. The leading figures in the group resided in more than half a dozen cities—Cleveland, New York, Philadelphia, Pittsburgh, Oil City, Titusville, and Parkersburg—and general administrative staffs had grown up in both New York and Cleveland, not to mention smaller units at other points.

Standard Oil executives realized the desirability of more careful consideration of "the general interest," to use their own term. They needed to study each function and each company in which the Standard Oil group held shares in relation to the welfare of the whole combination, if real unity of operations was to be achieved.

Problems involving each of the various functions performed by the combination called for decisions on all its wide-flung operations. Should management sell the three or four units producing crude oil which had been acquired in connection with purchases of other properties, or should more producing wells be brought into the organization? During 1881 managers of the National Transit Company (United Pipe Lines division) feverishly sought to please producers in the flush Bradford field by laying pipes to every new well and by erecting tankage at an unprecedented speed. Simultaneously, that Standard Oil unit was trying to avert the unwelcome competition from the still obdurate Tide-Water Pipe Company and was laboring to complete the network of trunk pipelines to all refineries of the combination. This prospective revolution in the transportation of crude oil demanded decisions of utmost importance as to the location, size, and special functions of various refineries. Should the managers give the signal for the expansion of those on the Atlantic seaboard, such as the Bayonne plant, manufacturing primarily for the foreign market? The possibilities of increasing and improving by-products merited exhaustive exploration and development. Further economies in auxiliary operations, such as making barrels, shooks, paint, glue, acid, and cans, had to be pursued and effective methods of disseminating the latest and best manufacturing techniques throughout the organization had to be devised.

One of the most imperative needs was to strengthen Standard Oil's marketing armor at home. The plans for manufacture on a large scale at lower cost necessitated the development of a bigger and more dependable market. The absence of clear delineation of territories led to conflict between such quasi-independent marketing concerns as the Chess-

Carley Company and the Waters-Pierce Oil Company, lessened efficiency, and required the services of a strong umpire. Over large areas Standard Oil salesmen dealt almost exclusively with outside wholesalers, with resultant frictions to be discussed later. Price wars in many areas during 1881 reflected the existence of vigorous competition. Standard Oil executives had to decide whether they could best attain their goal of a larger volume of sales by selling to middlemen or by adding to their own 130 wholesale bulk stations.[2] And where they distributed kerosene to retailers, should they continue to utilize barrels filled at the bulk stations or push the use of tank wagons, a method just in the trial stage?

Foreign marketing, which had received but scant direct attention from executives of Standard Oil companies, especially called for co-operative decision and action. Although more than 50 per cent of the kerosene, the chief product of the combination's refineries, was consumed abroad, it was almost exclusively sold in the United States to export merchants or representatives of foreign importers. As will appear later, the executives of the combination found certain weaknesses in this method but had taken only a few tentative steps to participate more directly abroad. The Standard Oil Company (Ohio) had invested more than $32,000 in James Corrigan's refinery in Galicia, Austria-Hungary, and almost $123,000 in foreign facilities for restoring secondhand barrels. On the books of the Ohio company was also carried "Adventures in the name of T. C. Bushnell," which included by 1879 an interest in Meissner, Ackermann & Company, a partnership of export merchants. The following year another affiliated firm, Thompson & Bedford Company, Limited, moved to meet the growing Russian competition by establishing in Germany its own agent to sell lubricants.[3] At about the same time, Standard Oil refiners were most concerned at the complaints made by European petroleum importers about the burning quality of the kerosene made from Bradford oil. Should Standard Oil take concerted steps to develop closer contacts with the important foreign markets for its products, both to have more accurate information on the character of demand and to meet growing competition from foreign refiners?

Other problems arose from the extent and geographical spread of the holdings of Ohio Standard. That corporation had assets in thirteen states and several foreign countries. The properties included refineries in Ohio, New York, New Jersey, and Pennsylvania (three small ones in process of being dismantled), and bulk marketing stations at Toledo, Albany, Troy, Hartford, New Haven, Bridgeport, Providence, Fort Wayne, Chi-

cago, Englewood (Illinois), Decatur, Keokuk, St. Paul, Minneapolis, and San Francisco. Several of the refineries had barrel factories and paraffin works. Cooperage properties were located at Celina in Ohio and at Indianapolis, Bluffton, Ossian, and Kokomo in Indiana. Ohio Standard also

Table 1 MISCELLANEOUS INVESTMENTS OF THE STANDARD OIL COMPANY (OHIO), DECEMBER 31, 1881

Working Capital in Firms under Special Contract	*Amount*
Scofield, Shurmer & Teagle	$ 10,000.00
Pioneer Oil Company	10,000.00
W. H. Doane[a]	41,833.37
F. H. Penfield[b]	20,000.00
Meriam & Morgan Paraffine Company	150,000.00
Adventures in name of T. C. Bushnell	75,000.00
Loans	
Paine, Ablett & Company, Limited	5,000.00
Republic Refining Company	5,714.75
John Huntington	19,740.00
Keokuk Oil Tank Line	10,000.00
Waters-Pierce Oil Company	20,000.00
Chess-Carley Company	31,131.36
F. D. Carley	207,195.68
J. M. Congdon[b]	15,501.78
J. D. Rockefeller	58,805.54
John C. Compton[b]	5,000.00
A. C. Armstrong[b]	6,000.00
Galicia (Austria) Adventure	12,300.91
Bonds	
United Pipe Lines	98,385.26
"Fixed Investments"	
Galicia (Austria) Investment 50%	20,000.00
Cleveland Herald Stock	10,000.00
Investment Carried on Private Ledger[b]	70,000.00
Foreign Construction—Cooperage Purposes	122,635.95
Miscellaneous Investments[b]	288,112.52
In Liquidation	
J. A. Bostwick & Co.	

[a] W. H. Doane had an exclusive contract to refine the naphtha distilled by Cleveland plants in or associated with the combination.
[b] The nature of the businesses of F. H. Penfield, J. M. Congdon, John C. Compton, A. C. Armstrong, Investment Carried on Private Ledger, and Miscellaneous Investments has not been ascertained. Other significant items are discussed in later sections.
Source: SONJ, Consol. Accts. of S. O. Trust, Dec. 31, 1881.

owned tank cars valued at $1,208,916 and tank wagons valued at $3,795. In addition to the holdings enumerated above, the Ohio corporation held interests through capital investments, loans, and bonds in various other firms.[4] (See Table 1.)

Developments in Pennsylvania during 1881 pointed dramatically to the danger of Ohio Standard's owning properties outside its home state. Under a reinterpretation of a tax law of 1868, the auditor-general of the Keystone State brought suit against the Ohio corporation for approximately $3,200,000 in back taxes and penalties. Selecting the wealthy Standard Oil Company (Ohio) as a test target, the Pennsylvania official sought to prove that taxes on an out-of-state company doing business in the state should and could be levied not only upon its physical properties within the state, and capital stock representing them, but also upon the entire capital stock and dividends of the "foreign" corporation. If Pennsylvania's contention was upheld, in retaliation and for revenue, other states, especially New York, could be expected to follow the leader.[5]

It seemed imperative, therefore, to the executives of the Standard Oil family of companies that their chief Ohio unit should be divested of its out-of-state holdings as soon as practicable. Such measures would at once obviate the possibility of endless litigation and of double taxation as well.[6] This was not the first or the last time that tax policies of governmental units influenced the decisions of oil companies.

The creation of special corporations to hold properties in each state, and of a central legal entity to hold the combination, would also relieve Standard Oil managers of no little embarrassment on another score. John D. Rockefeller and others, in a suit against their outstanding rivals, Scofield, Shurmer & Teagle, truthfully swore in affidavits that Ohio Standard did not own such firms as Charles Pratt & Company and The Sone & Fleming Manufacturing Company, Limited. As a consequence, George H. Vilas had to caution employees of the latter company not to endorse envelopes with such statements as "for Geo. H. Vilas, Auditor of Standard Oil Co."[7] The need to seek refuge in statements which the public, unaware of the intricacies of ownership in the Standard Oil companies, considered legal subterfuge if not outright falsehoods, could be obviated by the organization of separate companies for each state and by the creation of a recognized single unit to hold the stocks of all associated companies.

A major weakness of the combination lay in the method of holding the securities of the firms in the Standard Oil alliance. The existing arrangement was unwieldy and risky. George H. Vilas, Myron R. Keith, and George F. Chester held in trust the stocks of various corporations and limited associations of partners for forty-one stockholders, who also owned all the shares of The Standard Oil Company (Ohio). The three trustees had no specific authority to manage the properties. The 1879

trust arrangement had been improvised to replace the holding of the securities of associated companies by scattered individuals. It was intended to be temporary. The agreement made no provision for continuity through election of other trustees in case of death and no arrangement for transfer of certificates of ownership. Furthermore, Ohio Standard's stock was not held by Vilas, Keith, and Chester, nor were the Cuban refining properties jointly owned by Edward Conill and John D. Archbold within the purview of the trustees.[8]

Individuals not among the forty-one investors held either a minority or majority of outstanding shares in twenty-six companies associated with the Standard Oil alliance, thereby complicating management of the integrated entity. By forming a central holding instrument Standard Oil executives would have a better opportunity to reduce or eliminate outside influence by buying out minority interests or by inducing them to enter the inner circle of investors. If neither objective could be accomplished, centralized administration would aid materially in working effectively with non-Standard stockholders in "the general interest."

At the least two other considerations appeared in the discussions leading to the establishment of a more effective administration than had hitherto existed. First, it was felt that the affairs of the entire business should be kept as free from public scrutiny as possible; it mattered not that evasiveness, ambiguity, and secrecy had already fanned the flames of public distrust. Secondly, there was no doubt that the central office should be located in New York. That city was the financial center of the business, most exports were sold there, and a staff was already functioning in the New York office of Ohio Standard.[9]

How to achieve the simplified and centralized organization incorporating the wishes of the stockholders challenged the best legal talent available. The legal-minded Flagler and the clear-thinking, rotund S. C. T. Dodd bent their minds to the task. "I did not know enough about legal matters," John D. Rockefeller modestly and truthfully said later, "for so progressive a step" as the plan that was evolved.[10]

Given the desires of their stockholders, the existence of extensive minority interests in twenty-six companies, and the status of corporation law in 1881, Standard Oil executives really had few alternatives to the trust method for organizing their large combination of capital. Although a considerable amount of American business was beginning to be conducted on a national basis, there was then, as now, no federal incorporation law. As indicated in extant letters and memoranda, Dodd and Flagler

surveyed the possibilities of amalgamating all properties in one corporation and of utilizing either an unincorporated joint-stock association or a corporation or a group of trustees as an instrument for holding the stocks of the companies in the group. A corporation owning all the properties was open to attacks similar to that which Ohio Standard was experiencing in Pennsylvania at the time. Dodd pointed out that to utilize a New York corporation for holding all the securities of the forty-one investors would require a special enactment and that the legislature might not be agreeable to the idea; the general incorporation laws of New York, New Jersey, or Delaware were then not broad enough to permit the organization of a holding company. Unincorporated joint-stock associations were limited to some extent by the ordinary laws governing partnerships and were particularly troublesome when deeds to property were transferred. Only the trust form of organization gave assurance that a maximum of secrecy could be maintained about the activities of the combination. The concept of trusteeship was sanctioned by common law and had been utilized by Standard Oil men in the 1870's, though prior to 1882 they used the trust as a device for holding securities of a group of investors and not as an instrument for exercising managerial control over the firms involved.

As signed on January 2, 1882, the Standard Oil Trust Agreement provided solutions to all the general problems mentioned, and more. In the first place, the document set up a trust, which was the sole and central holding agency for all the securities of the participating investors in forty specifically named companies. Affixed to the document were the signatures of the forty-one stockholders and those of Myron R. Keith, George F. Chester, and George H. Vilas, trustees under the 1879 agreement.[11]

Properties put into the Trust by the forty-one investors were valued at $70,000,000 in terms of Trust certificates. The names of the companies, their capitalization, and the percentages owned by the participants in the Trust are presented in Table 2. Actually, as of January 1, 1882, the books of the Standard Oil combination showed a net value of only $55,221,738.[12] Hence, unless the earning power of all the companies was given a value, the issuance of $70,000,000 in certificates represented almost $15,000,000 in what is popularly called watered stock. In view of the actual earnings of the business the capitalization of $70,000,000 proved to be conservative.

The Agreement set the number of Trustees at nine, named them, and

Table 2 STOCKS OF COMPANIES CONTRIBUTED TO THE STANDARD OIL TRUST BY FORTY-ONE INVESTORS JANUARY 2, 1882

Name of Company	*Capitalization*	*Percentage Put in Trust*
Wholly Owned		
Acme Oil Company (New York)	$ 300,000	100.00
Acme Oil Company (Pennsylvania)	300,000	100.00
Atlantic Refining Company, The	400,000	100.00
Bush & Company, Limited	15,000	100.00
Camden Consolidated Oil Company	200,000	100.00
Elizabethport Acid Works	28,000	100.00
Imperial Refining Company, Limited	300,000	100.00
Charles Pratt & Company	500,000	100.00
Paine, Ablett & Company, Limited	321,000	100.00
Standard Oil Company (Ohio), The	3,500,000	100.00
Standard Oil Company (Pennsylvania)	400,000	100.00
Smith's Ferry Oil Transportation Company	20,000	100.00
Solar Oil Company, Limited	100,000	100.00
Sone & Fleming Manufacturing Company, Limited, The	250,000	100.00
Partly Owned		
American Lubricating Oil Company	200,000	88.75
Baltimore United Oil Company	600,000	83.73
Beacon Oil Company	100,000	70.00
Bush & Denslow Manufacturing Company	300,000	50.00
Central Refining Company (Pittsburgh)	255,300	88.83
Chesebrough Manufacturing Company, Consolidated	500,000	50.98
Chess-Carley Company	600,000	50.00
Consolidated Tank Line Company	125,000	50.00
Devoe Manufacturing Company	300,000	90.00
Eclipse Lubricating Oil Company, Limited	175,000	91.42
Empire Refining Company, Limited	100,000	80.00
Franklin Pipe Company, Limited	50,000	19.00
Galena Farm Oil Company, Limited, The	50,000	77.50
Galena Oil Works, Limited	150,000	77.50
Germania Mining Company	30,000	92.67
Inland Oil Company	50,000	50.00
Keystone Refining Company	75,000	70.00
Maverick Oil Company	100,000	70.00
National Transit Company	30,000,000[a]	85.54
Portland Kerosene Oil Company	200,000	46.70
Producers' Consolidated Land & Petroleum Company	1,000,000	65.13
Signal Oil Works, Limited	100,000	38.75
Thompson & Bedford Company, Limited	250,000	80.00
Vacuum Oil Company	25,000	75.00
H. C. Van Tine & Company, Limited	100,000	75.00
Waters-Pierce Oil Company	400,000	40.00

[a]Only $29,400,000 had been issued by December 31, 1881.
Source: Standard Oil Trust Agreement, Jan. 2, 1882.

laid down the general rules which they were to follow. John D. Rockefeller, O. H. Payne, and William Rockefeller were to hold office until the first Wednesday of April, 1885; J. A. Bostwick, H. M. Flagler, and W. G. Warden until the first Wednesday of April, 1884; and Charles Pratt, Benjamin Brewster, and John D. Archbold until the similar date in 1883. One-third of the number was to be elected every year by the certificate holders or their proxies. A wide range of powers and duties was conferred upon the Trustees, including the filling of vacancies in the board of Trustees, the making of bylaws, the issuing of trust certificates, and the creation of executive and other committees. Though not specified in the Agreement, headquarters were to be at 44 Broadway, New York, until 1885.

By all odds, Article 15 of Part III set forth the outstanding innovation in the Trust Agreement. It centralized control in the nine Trustees. It read:

> It shall be the duty of said Trustees to exercise general supervision over the affairs of said Standard Oil Companies, and as far as practicable over the other Companies or Partnerships, any portion of whose stock is held in said trust. It shall be their duty as Stockholders of said Companies to elect as Directors and Officers thereof faithful and competent men. They may elect themselves to such position when they see fit so to do, and shall endeavor to have the affairs of said Companies managed and directed in the manner they may deem most conducive to the best interests of the holders of said Trust Certificates.

By that authority the Trustees exercised full managerial power, limited only by partial ownership in twenty-six firms by outside stockholders, over the corporations and limited partnerships represented on January 2, 1882, and over all those companies brought into the combination between that date and 1892.

The Trust Agreement also encompassed both short- and long-range plans for reorganizing the holdings of the forty-one participants. It stipulated that, as soon as practicable, corporations bearing the name of Standard Oil Company were to be organized in New Jersey, New York, Ohio, and Pennsylvania; existing charters and organizations, however, could be used in the last two states. At any time after the agreement, if and when deemed advisable by the Trustees, corporations bearing the Standard Oil title were to be formed in other states and territories, though until the Trustees decided to organize new corporations the existing companies should continue to hold their properties and operate their businesses.[13]

In short, the Standard Oil Trust provided for a centralization and systematization of the combination already in operation. In a new legal form it pooled the holdings of forty-one stockholders in companies and partnerships engaged in buying, transporting, storing, refining, and marketing petroleum products. The same group of individuals, who had formerly held authority as the largest stockholders in the various companies in the Standard Oil alliance, now held it specifically as trustees. The Trust Agreement made possible the easy transfer of holdings, kept all operations from the public gaze, and was in itself a major step toward the more efficient administration of the integrated petroleum enterprise.

THE BIRTH OF JERSEY STANDARD AND NEW YORK STANDARD

As specified in the Trust Agreement, Jersey Standard and the Standard Oil Company of New York were organized in 1882. The immediate purpose of their creation was the vesting of Ohio Standard's manufacturing, storing, and transshipping facilities in New Jersey and New York in corporations domiciled in those states. A secondary objective was the formation of a central organization in New York City. Of the two companies, New York Standard was the more important until 1899. Both corporations were distinctly children of the Trust and may best be understood in their early years as instruments for the more effective management of the activities of that entity. Since several functions of the two companies were performed by identical operating heads, the companies must be treated together to a considerable extent. By prearrangement Siamese twins were born to the Standard Oil Trust in its first year.

August 5, 1882, witnessed the organization of the Standard Oil Company of New Jersey, the first title of the present company. The incorporators were H. M. Flagler, Paul Babcock, Jr., James McGee, Thomas C. Bushnell, and the Trustees of the Standard Oil Trust. Each of the men named subscribed for one share, and the Trustees for 29,996 shares, which made up the entire capital of $3,000,000.

The certificate of incorporation limited the functions of Jersey Standard to the processing, packaging, and sale of products from petroleum and the manufacture of packages and acids. The stated purposes of the new company were "the refining of petroleum; the manufacturing of the various products thereof; the purchasing of the crude material and sale of the manufactured products thereof; the manufacture of barrels, boxes, cans and other packages in which the manufactured products may be

kept or transported; the manufacture and restoration of acids and whatever substances may be used in the manufacture of the products of petroleum."[14]

By virtue of its stated powers the Jersey Company began its business operations on August 30, 1882. At that time it purchased the manufacturing properties and docks of Ohio Standard located in the state of New Jersey. Entries in the Journal of the Standard Oil Company of New Jersey reveal the following values of the acquisitions:[15]

Real Estate	$ 820,840.50
Bayonne Refinery Construction	894,656.90
Bayonne Barrel Factory Construction	169,398.61
Bayonne Paraffin Works Construction	123,587.34
Weehawken Docks	8,286.68
Eagle Refinery Construction	178,435.64
	$2,195,205.67

For those properties and $804,794.33 in cash, Jersey Standard paid in its stock at par to the Trust, which already held the stock of Ohio Standard. The new corporation thus began with adequate working capital and sizable operating units.

These initial properties of Jersey Standard were of diverse origin. The refinery at Bayonne dated from 1875, when Frederic Prentice, organizer of the Producers' Consolidated Land & Petroleum Company, started the plant as a phase of his plan to integrate his oil operations. In financial difficulties two years later, Prentice sold all his oil properties to Standard Oil interests, the Ohio Company taking title to the New Jersey plant. During the next four years refining capacity at Bayonne was increased to a total of twelve stills for running crude oil, while the barrel factory and paraffin plant were added. Another refinery, the Eagle Works at Communipaw, New Jersey, came into the Standard Oil orbit with the National Storage Company in 1881. The nucleus of the Eagle Works was the dismantled equipment brought from a small plant at Carbondale, Pennsylvania. The construction at Communipaw had been started by Joseph D. Potts and his associates in National Storage after their unsuccessful tilt in 1877 with Rockefeller and his associates over the expansion of The Empire Transportation Company. The Standard Oil Company (Ohio) had leased and operated the works prior to transfer of title to Jersey Standard in 1882. The next year another Standard Oil affiliate, the Eagle Oil Company, took over the property but sold it back to the

Jersey Company in 1892. The oil yard and docks at Weehawken had been leased from the Erie Railroad Company on May 1, 1874, and later purchased.[16]

Not only the ownership of docks but the previous experiences of the leading active directors of Jersey Standard reflected the primary function

Table 3 LIST OF DIRECTORS AND OFFICERS OF STANDARD OIL COMPANY OF NEW JERSEY, 1882-1892

Directors	From	To
H. M. Flagler	August 10, 1882	December 5, 1883
James McGee	August 10, 1882	January 13, 1885
Paul Babcock, Jr.	August 10, 1882	May 5, 1892[a]
Thomas C. Bushnell	August 10, 1882	May 5, 1892
George H. Vilas	August 10, 1882	January 13, 1891
F. S. Emmons	December 5, 1883	January 13, 1885
J. H. Alexander	January 13, 1885	May 5, 1892[b]
J. F. Freeman	January 13, 1885	January 13, 1891
Officers		
President		
H. M. Flagler	August 10, 1882	January 29, 1883
James McGee	January 29, 1883	January 13, 1885
Paul Babcock, Jr.	January 13, 1885	May 5, 1892
Vice-President		
Thomas C. Bushnell	August 10, 1882	November 21, 1888
J. H. Alexander	November 21, 1888	May 5, 1892[b]
Secretary		
George H. Vilas	August 10, 1882	January 13, 1891
L. D. Clarke	January 13, 1891	May 5, 1892[b]
Treasurer		
Paul Babcock, Jr.	August 10, 1882	January 13, 1885
J. F. Freeman	January 13, 1885	January 13, 1891
W. T. Wardwell	January 13, 1891	May 5, 1892[b]
General Superintendent		
J. H. Alexander	January 13, 1885	November 21, 1888

[a]Continued to December 30, 1902.
[b]Continued to June 19, 1899.
Source: SONJ Minute Bk. The secretary and treasurer ceased being drawn from the directorate after January 13, 1891. The number of directors was reduced to three on that date.

of the company between 1882 and 1892—manufacturing kerosene chiefly for export. At the birth of the corporation James McGee, Paul Babcock, Jr., T. C. Bushnell, and J. H. Alexander were active in the Standard Oil family as experts either in refining or in sales for export trade, or both. Their positions as officers and directors in Jersey Standard are shown in Table 3. When the lunchroom for executives was instituted at 128 Pearl

Street, New York, in 1876, all four had been among the sixteen privileged to eat there,[17] although prior to 1899 only McGee rose to the top rung of the administrative ladder in the Standard Oil combination, which until 1892 was the Executive Committee of the Trust.

By 1882 James McGee (1827-1898) had been concerned, directly and indirectly, with the export trade of New York City for forty-one years. He had entered the employ of cotton brokers in 1841 and risen to partnership. Hard hit by the decline in cotton sales during the Civil War, the firm dissolved early in 1863. McGee immediately joined Degin, Taft & Lee, brokers and dealers in petroleum. Both McGee and Livingston Roe, who entered the service of the firm in 1864, later became partners in Taft, Lee & Company, which was organized after the death of Degin. In January, 1874, McGee withdrew from the firm to become the secretary and treasurer of the Devoe Manufacturing Company, by that time in the Standard Oil alliance. When Josiah Macy's death in 1876 left the presidency of Devoe vacant, McGee was elected to the post, thereby adding the title of chief executive to his prime function as general manager of a corporation devoted primarily to the manufacture and canning of kerosene for export.[18] He succeeded Flagler as president of Jersey Standard in 1883, and his calm judgment and extensive knowledge of marketing for export won him a place in the top rank of Standard Oil managers during the last ten years of his life.

Paul Babcock, Jr. (1841-1903), the son of a New York importer who had been closely associated with the celebrated merchant and financier, George Peabody, was one of those numerous successful businessmen who began a career at fourteen years of age as an office boy at a wage of one dollar per week. By the time he had reached eighteen he was the superintendent of a castor oil factory. After three years of service in the Union Army, he bought rice in the South on commission for New York merchants, later becoming an oil broker and acquainted with Standard Oil men in New York. Like McGee, he joined the Devoe Manufacturing Company. In 1876 he was chosen secretary of that concern and was soon regarded as an expert in the manufacture of kerosene and its packaging in cases and cans for export. By 1885 Babcock was president of two companies in the Standard Oil combination, The Sone & Fleming Manufacturing Company, Limited, and the Standard Oil Company of New Jersey. He is reported to have shown marked personal interest in the welfare of employees and to have possessed a native aptitude for management of large business enterprises. His frank letters to John D. Rockefeller

reveal him to have been addicted to exact statistical detail and to measures tending to reduce costs. A straightforward man of strong individual opinions, Babcock was always alert to the interests of refining companies in the Standard Oil combination.[19]

Thomas Campbell Bushnell (1842-1902), always called Colonel because of his rank in the Civil War, was a son of Vandergrift's associate, Daniel Bushnell, and brother-in-law of W. G. Warden. Aided by these connections, young Bushnell entered the employ of Warden, Frew & Company and served as the first secretary of The Atlantic Refining Company. After these firms had become part of the Standard Oil alliance, he acted as the New York representative of Atlantic, a position he held until his death. Characterized by an observer as one of the six "most active dynamos" in the New York office of the Standard Oil combination, he played a significant role as the first chairman of the Export Trade Committee in the 1880's and 1890's, when its dramatic pioneering moves into foreign trade were executed.[20] He also served as a director and vice-president of Jersey Standard.

James Henry Alexander (1837-1919) brought to Jersey Standard two decades of experience as a specialist in constructing and operating refineries. After graduating from college, he manifested an interest in manufacturing operations. In 1864 he built a small refinery for Lockhart & Frew at McKee's Rocks near Pittsburgh. Among the high spots of his career were the erection of Vandergrift's Imperial Works at Oil City by 1873, later transfer to New York and appointment in 1878 as manager of the Long Island and Queens County plants operated by J. A. Bostwick & Company, and the supervision of the expansion in the Bayonne Refinery during the 1880's and 1890's. From 1882 until his retirement in 1901, acting either as general superintendent or as general manager of refining for both Jersey Standard and New York Standard, Alexander undoubtedly ranked as one of the outstanding Standard Oil experts on his specialty in the New York area, if not in the entire combination.[21]

Jersey Standard started very humbly in one respect. It had no managerial payroll at any time during its early years. Flagler, its first president, and George H. Vilas, its first secretary, were paid by the Trust, McGee by the Devoe Manufacturing Company, Babcock by The Sone & Fleming Manufacturing Company, Limited, and Bushnell by The Atlantic Refining Company. Both J. F. Freeman, who served as treasurer, and J. H. Alexander, who was for some years vice-president as well as general superintendent of refining, were on New York Standard's salary books,

which also carried George Van Winkle, the first superintendent of the refinery at Bayonne, and all his staff.[22] No trace remains of any bookkeeping adjustment between the companies, although such might well have existed. For all practical purposes Jersey Standard at its beginning was, at the operating level, a unit of New York Standard. To phrase it more delicately, New York Standard and Jersey Standard were operated as one unit.

Actually the Standard Oil Company of New York ranked higher than its Siamese twin at the time of their incorporation and for some years thereafter. Indicative of New York Standard's importance was the fact that four of the nine Trustees of the Standard Oil Trust—William Rockefeller, J. A. Bostwick, Benjamin Brewster, and Charles Pratt—were among the five original incorporators. The capital of the New York corporation was second in size only to that of the National Transit Company in the Standard Oil family. As shown elsewhere in this volume,[23] New York Standard immediately began to serve as the main instrument for export sales, as the chief banking unit in the associated companies, and as the major supplier of staff personnel for the centralized administration of the combination. And at its inception the Standard Oil Company of New York was one of the leading refining units in the Trust.

All the $5,000,000 capital stock of New York Standard was issued at par to the Trustees of the Standard Oil Trust in exchange for properties valued at $2,394,807.06 and the balance in cash. The acquisitions consisted chiefly of the accumulations made in New York State by William Rockefeller for Ohio Standard and by J. A. Bostwick & Company. The plants included three refineries on Long Island near or on the East River—two small ones, known as the Brooklyn Refinery and the Empire Yard, and a larger one, the Long Island Refinery, the book value of which had grown from $35,000 in 1870 to more than $500,000 in 1882. With the refineries came canning plants, warehouses and other storage facilities, docks, a river and harbor service, contracts, good-will, and trade-marks. Additional properties encompassed the Crosstown pipeline, which ran from the North River railroad yards at Sixty-fifth Street in New York to Hunter's Point on Long Island, and almost a million dollars of real estate in Brooklyn, Long Island City, and New York City.[24]

The property of George H. Hopper, the leading repairer of barrels for the alliance, constituted a more important addition to New York Standard's assets than the appraised value of $137,000 would indicate. Packaging played a singularly significant role in the petroleum industry, and

Hopper took the center of the stage for that function within Standard Oil. Prior to 1882, while leasing and operating Ohio Standard's paint mill in Cleveland, he had conducted his barrel-repairing and -filling activities in his own plants near several of the combination's refineries under exclusive contracts with various Standard Oil corporate units. Hopper's inventory included manufacturing apparatus, glue, and stocks on hand in Cleveland, Pittsburgh, Oil City, Titusville, Olean, Bayonne, Weehawken, Hunter's Point, and Williamsburg (Long Island), not to exclude some barrel-repairing equipment in Europe. Encompassed in the sale price for his properties was an item of $25,000 labeled: "Bonus for Good Will, Contracts, Patents, Trade Marks, etc." In exchange for securities and some cash Hopper turned over his facilities to New York Standard and henceforth operated as the head of a department within that company.

In view of their later growth, perhaps it is well to keep clearly in mind how limited New York Standard and Jersey Standard were in 1882. The former had not yet acquired the New York State plants and the businesses of the Pratt Manufacturing Company, the Empire Refining Company, Limited, The Sone & Fleming Manufacturing Company, Limited, the Bush & Denslow Manufacturing Company, the Devoe Manufacturing Company, the Thompson & Bedford Company, Limited, and the Acme Oil Company. At the outset neither New York Standard nor Jersey Standard owned any domestic wholesaling outlets, and the latter company possessed nothing outside the state of its domicile. Yet New York Standard, from the date of its creation, occupied the dominant position in the centralized administration of the Standard Oil group, and Jersey Standard had risen to parenthood of the combination by 1899.

THE COMMITTEE SYSTEM

Both before and after creating new companies in New Jersey and New York, Standard Oil executives were gradually working out managerial techniques supplementary to the legal organization afforded by the Trust. While final authority for general policy formulation and decision making clearly rested with the Trustees, Rockefeller and his associates added to that legal body a series of committees vested largely, though not exclusively, with advisory powers. By 1886 the pattern was virtually complete, with New York Standard owning a headquarters building and acting as the chief supplier of administrative and clerical personnel. Modified by thirteen more years of use, this was fundamentally the organization in-

herited by the Standard Oil Company (New Jersey) when it became the parent company in 1899.

A series of unco-ordinated stimuli induced Standard Oil executives to create the supplementary managerial mechanism. Among these pressures and prods were the growing size and increasing complexity of the enterprise, the variety of functions requiring integration into a smooth flow from producing wells to the tanks of retailers, the desirability of centralized purchasing, previous specialized experience by administrators below the top echelon, the recurrence of issues only experts could resolve, and the need for the most comprehensive and accurate information in making daily decisions.

Table 4 TRUSTEES OF THE STANDARD OIL TRUST, 1882-1892

Archbold, John D.	1882-1892
Bostwick, Jabez A.	1882-1887
Brewster, Benjamin	1882-1888
Flagler, Henry M.	1882-1892
Payne, Oliver H.	1882-1884
Pratt, Charles	1882-1891
Rockefeller, John D.	1882-1892
Rockefeller, William	1882-1892
Warden, William G.	1882-1885[a]
Rogers, Henry H.	1885-1892
Hutchins, Horace A.	1887-1892
Tilford, Wesley H.	1887-1892

[a]Estimated.
Source: Text and references cited.

Not the least pressing inducement to the formation of a new type of central administrative organization was the change in the membership of the Trustees during the years 1882-1892.[25] (See Table 4.) Four members resigned, three of them after periods of diminishing activity, and one died. O. H. Payne never assumed full responsibility as one of the nine top managers after 1882, resigned as a Trustee two years later, and soon terminated active service with Ohio Standard. J. A. Bostwick ceased his daily participation in Trust affairs in 1884 or 1885, but he did not hand in his resignation until 1887. W. G. Warden was no longer active by that year, though the date of his actual departure remains elusive. Benjamin Brewster first attempted to resign in 1885: "the duties are—should be—and must be absorbing," he commented; in his estimation it was better both for the Trust and himself "that a younger man, anxious for work and fresh for the contest," should replace him.[26] Pressed to remain,

Brewster curtailed his activities but did not sever his connection with the Trust until 1888. H. H. Rogers was elected to Payne's place in 1885, but he achieved more importance after he took over Brewster's main function as the expert among the Trustees on natural gas and pipeline matters. W. H. Tilford, a protégé of Bostwick, and H. A. Hutchins, from Ohio Standard, were both elected Trustees in 1887. Both had specialized in marketing west of the Alleghenies and south of the Mason-Dixon line. The unexpected death of Charles Pratt at his desk in 1891 left a great gap in the ranks of experienced Standard Oil merchant-manufacturers and top administrators. His place among the Trustees was not filled immediately, and his son and ultimate successor as chief representative of the family interests—C. M. Pratt—specialized in marketing, especially in domestic trade.

Given these changes in the body bearing the legal responsibility for managing Standard Oil affairs, administrative assistance and expert advice became imperatives. By 1892 only four men—the two Rockefellers, Flagler, and Archbold—remained out of the original nine experienced in making decisions for "the general interest," and Flagler gradually had expanded his expenditures of money, time, and energy in developing Florida. The increasing burden of a growing organization with each passing year placed a premium upon aid and advice. At the same time the narrower training of new Trustees pointed in the same direction.

Upon their experience Rockefeller and his associates gradually evolved a committee for the day-to-day management of the Standard Oil group of companies. When Payne chose not to move to New York when all other top managers did, in 1882 the Trustees took advantage of a provision of their bylaws to authorize the other eight to act as the Executive Committee. The minimum number was reduced to seven in 1884. Other leading managers were called in from time to time to sit with the committee in making decisions. Even before he was elected a Trustee, Rogers participated in formulating general policies, and probably the same was true of Tilford and Hutchins. In 1888 James McGee began a term of ten years on the Executive Committee,[27] although he was never listed among the Trustees.

For practical purposes, the Executive Committee in reality consisted of those top managers who were in attendance on any given day. John D. Rockefeller, though kept fully informed, was often absent from deliberations, even before his illness in 1891. Other men were away on inspection trips for Standard Oil, other business interests, and vacations. "Mr.

Flagler and myself were alone in the committee to-day," wrote Archbold to J. D. Rockefeller on June 5, 1885, "Mr. Rogers having gone to spend the day with his children."[28] This flexible committee, changing in personnel and form from time to time, served as the central guiding force of Standard Oil activities throughout the years to 1911.

This informal Executive Committee acted as the policy-formulating body and chief executive agency of the combined Standard Oil enterprises. In daily meetings members arrived at decisions by consultation and agreement. They formulated long-range policies, approved or disapproved recommendations from subordinate committees and executives, and sought to maintain balance and integration among the various functions as well as harmonious co-operation among all the companies in the giant combination.

To the desks of Executive Committee members came not only problems of general policy but also many details of "routine" management, including those questions upon which subordinates could not agree. In 1882 the committeemen asked that all appropriations of $5,000 or over for any constituent company should be forwarded for their approval. Beginning on January 1, 1886, annual reports of all salaries over $600 per year paid by the affiliated companies were made to the Executive Committee, which, acting as a Salary Committee, considered all recommendations and requests for raises.[29]

A special group of Trustees, the Proxy Committee, implemented their relations with all affiliates at annual meetings. Consisting at first of Pratt, Flagler, and Bostwick, the last-named succeeded by Archbold in 1885, the committee existed to vote the shares held by the Trustees in all elections of directors, who in turn chose the officers of the companies contributory to the Trust.

Parallel to the Proxy and the Salary committees on the second echelon of administrative and advisory units, a group of other specializing committees gradually emerged. In practice the recommendations of these committees were usually accepted by the top managers. By 1887, the first year for which extant data on the subject are complete, the major committees were Manufacturing, Export Trade, Lubricating Oil, Transportation, Cooperage, Case and Can, and Domestic Trade. The names reveal the primary functions. The Transportation Committee disappeared from the records after 1888, probably in response to the passage of the Interstate Commerce Act, but the "Pipeline Interest," headed by Daniel O'Day, certainly had one form of transportation as its major concern. A

Production Committee, which reported directly to John D. Archbold on the Executive Committee, appeared soon after Standard Oil embarked on large-scale production of crude oil in 1889.

These major committees had a variety of origins. Both the Transportation and Export Trade committees had existed as informal groups in the late seventies. The Manufacturing Committee was organized in 1881. A year later the Cooperage group began as a unit to buy cooperage supplies. The Case and Can Committee, as noted elsewhere, took over some functions performed earlier by the Metal Committee and the Manufacturing Committee. The Lubricating Oil Committee constituted a fusion of two larger groups, with some interlocking membership, which had been concerned with Eastern and Western sales, respectively. The merger and reduction in number of members occurred after Silas H. Paine, the specialist in Western sales of lubricants, moved from Cleveland to New York late in 1885. The creation of the Domestic Trade Committee in 1886 at the suggestion of W. H. Tilford reflected the rising interest of top executives in North American marketing and a concatenation of difficulties.[30]

Selection of members for these committees involved a variety of considerations. Analysis of Table 5 indicates that few top managers continued to serve in these groups. Men were chosen for their special aptitudes and expert knowledge, and efforts were made to assure representation for all major companies concerned with a particular function. Some relatives of top managers rose rapidly, notably C. M. Pratt, H. A. McGee and Frank Rockefeller. The Tilford brothers were protégés of J. A. Bostwick. Not the least important desirable characteristic of a selectee for a committee assignment was his ability to hammer out conclusions in "the general interest" on the basis of consultation and agreement.[31] Service on a major committee provided excellent experience in decision making and, therefore, a first-class method of training replacements for executives in the top rank.

The Manufacturing Committee, the one with which Jersey Standard was chiefly concerned in its first years, was organized under the chairmanship of H. H. Rogers. Its first statistical clerk was Henry Clay Folger, Jr., a young man with a recent degree from Amherst College and later president of New York Standard. On May 1, 1881, he instituted in Manufacturing Book A a careful compilation of data on all phases of Standard Oil processing of crude oil, with emphasis on comparative costs and yields of various refineries in the combination.[32] Guided by this informa-

Table 5 LIST OF MAJOR ADVISORY COMMITTEES AND COMMITTEEMEN OF THE STANDARD OIL TRUST, 1887-1892[a]

Committees	*Members, 1887*	*New Appointees and Date*	*Salary Paid by*
CASE AND CAN	W. T. Wardwell, chr., res. 1891		Devoe Manufacturing Co.
	H. H. Rogers, res. 1887		Standard Oil Trust
	H. L. Davis, res. 1889		Atlantic Refining Co., The
	Paul Babcock, Jr., res. 1891		Sone & Fleming Manufacturing Co., Ltd., The
	A. J. Pouch	A. J. Pouch, chr. 1891	Standard Oil Co. of New York
		C. M. Pratt, 1887-1891	Pratt Manufacturing Co.
		W. B. Emerson, 1891	Sone & Fleming Manufacturing Co., Ltd., The
		James F. Ker, 1891	Standard Oil Co. of New York
		N. W. Harkness, 1891	Atlantic Refining Co., The
		H. A. McGee, 1891	Devoe Manufacturing Co.
COOPERAGE	A. M. McGregor, chr.		Standard Oil Co. of New York
	T. H. Wheeler		Standard Oil Co. of New York
	Martin Snider		Standard Oil Co. (Ohio), The
	W. M. McKelvy		Central Refining Co. (Pittsburgh)
	W. P. Thompson, res. 1889		Standard Oil Co. (Ohio), The
	G. H. Hopper		Standard Oil Co. of New York
	C. F. G. Heye		Standard Oil Co. of New York (Foreign Barrel Dept.)
DOMESTIC TRADE	W. P. Thompson, chr., res. 1889		Standard Oil Co. (Ohio), The
	W. H. Tilford, res. 1889		Standard Oil Co. of New York
	G. F. Gregory, res. 1891		Standard Oil Co. of New York
	D. S. Cowles, res. 1892		Standard Oil Co. of New York
	H. A. Hutchins	H. A. Hutchins, chr., 1890	Standard Oil Co. (Ohio), The
		C. M. Pratt, 1889	Pratt Manufacturing Co.
		C. M. Coburn, 1890	Standard Oil Co. of New York
		Alexander McDonald, 1891	Consolidated Tank Line Co.
		Frank Rockefeller, 1891	Standard Oil Co. (Ohio), The
		H. M. Tilford, 1891	Standard Oil Co. of New York

Committees	*Members, 1887*	*New Appointees and Date*	*Salary Paid by*
EXPORT TRADE	T. C. Bushnell, chr.		Atlantic Refining Co., The
	James McGee		Devoe Manufacturing Co.
	A. J. Pouch		Standard Oil Co. of New York
		C. F. Ackermann, 1891	Standard Oil Trust
		G. F. Gregory, 1891	Standard Oil Co. of New York
		Livingston Roe, 1892	Standard Oil Trust
LUBRICATING OIL	O. T. Waring, chr.		Standard Oil Co. of New York (Lubricating Oil & Paraffin Wax Dept.)
	E. T. Bedford		Thompson & Bedford Co., Ltd.
	Silas H. Paine		Standard Oil Co. of New York (Lubricating Oil, Western Sales Dept.)
MANUFACTURING	H. H. Rogers, chr., res. 1887		Standard Oil Trust
	J. H. Alexander		Standard Oil Co. of New York
	F. Q. Barstow		Acme Oil Co.
	H. L. Davis, res. 1889		Atlantic Refining Co., The
	A. M. McGregor	A. M. McGregor, chr., 1887	Standard Oil Co. of New York
		Paul Babcock, Jr., 1887	Sone & Fleming Manufacturing Co., Ltd., The
		J. A. Moffett, 1889-1891	Pratt Manufacturing Co.
		Clarence Vose	Pratt Manufacturing Co.
		N. W. Harkness	Atlantic Refining Co., The
TRANSPORTATION[b]	H. M. Flagler, chr.		Standard Oil Trust
	J. D. Archbold		Standard Oil Trust
	W. P. Thompson		Standard Oil Co. (Ohio), The
	W. H. Tilford		Standard Oil Co. of New York
	T. H. Wheeler		Standard Oil Co. of New York

[a]No complete information is available on the membership of the Production Committee or the "Pipeline Interest."
[b]The Transportation Committee was no longer listed in company books or salary records after 1888.
Source: Minute Bks. of Jersey Standard, New York Standard, Atlantic Refining, and Empire Refining Co., Ltd.; Rockefeller Recs., 1887-1892, *passim*.

tion, the committee sought to assure a regular flow of petroleum through all plants of the combination and to co-ordinate all manufacturing activities with changing supplies of crude oil and fluctuations in world-wide markets.

During the years 1881-1892 the statement of the powers of the Manufacturing Committee was changed. As stated in the Minute Books of the Jersey Standard and New York Standard for 1883, the duties of the members were "to consider all subjects relative to construction and the manufacturing interests" and case and can operations, and to advise the companies "relative thereto." Moreover "all officers and agents" were "instructed to carry out whatever measures" were recommended by said committee "unless contrary notice be given by resolution of the Board of Directors" of an individual company. Supervision of case and can operations, together with the functions of a Shook Committee and a Metal Committee, which existed as early as 1881 to centralize buying of tin and boxes for packaging export oil, was fused in a Case and Can Committee by 1887. From that date to 1892 the membership and powers of all the committees were more generally spread on the Minute Books of the constituent companies. During these years all committees retained expressed power only to advise.[33]

In the process of furnishing expert advice the committees sought to co-ordinate, standardize, and integrate the operations of all companies within their area of influence. The work of the Manufacturing Committee ranged from deciding upon major questions discussed in later chapters to relatively unimportant details. For example, in 1883 the Manufacturing and Cooperage Committees, acting jointly, agreed that for shipments in barrels from all refineries the dividing line between refining expenses and barreling and shipping expenses should be "the valve on the main filling line inside of the barreling house—the Refinery to furnish the same and keep it in repair."[34]

In other instances attempts to integrate activities of various units took the form of recommendations to an individual corporation. One to Jersey Standard in the autumn of 1885 is a case in point. Because the Cooperage Committee desired G. H. Hopper's charges to cover his actual costs for preparing and filling barrels at Weehawken with kerosene from Western (Ohio, New York, and Pennsylvania) refineries, his rates were raised from ten cents per barrel to twelve cents as of January 1, 1885.[35]

Some of the committees also performed definite managerial functions. The Export Trade Committee managed a pool of kerosene sales from 1880

to 1888 at least. The three individual members of the committee also held specific authority to make sales for export: T. C. Bushnell to dispose of kerosene in barrels or bulk, James McGee kerosene in cases, and A. J. Pouch crude oil in barrels, cases, or bulk.[36] This made possible more nearly complete co-ordination of the management of a particular function throughout the whole organization.

Centralized purchasing of supplies accompanied the committee system. The desire to have only one buyer for Standard Oil in the market for staves and headings was given as one reason for establishing a group on cooperage supplies. In like manner the Metal Committee and its successor (the Case and Can Committee) purchased all the tin and boxes needed by the entire combination for packaging tinned oil, and as early as 1882 the Manufacturing Committee was instructed to buy iron through one buyer.[37]

The lines of communication between the Executive Committee and the individual companies were well laid, as were those between the latter and the specialized committees. In "nearly all" cases a Trustee was "a president or a responsible representative" of an associated company. Hence, when the Executive Committee made a decision, in "nearly all" cases it merely made suggestions to its members in their capacities as heads of the constituent companies.[38] Similarly the members of the specialized committees were officers and directors of the separate companies, thus acting as legally constituted pipelines for the wishes of top management. A recommendation from one of the advisory units to a company headed by one of the committee members was likely to be acceptable. When Orville T. Waring, chairman of the Lubricating Oil Committee, recommended a course of action to the Thompson & Bedford Company, Ltd., President O. T. Waring of that company had no hesitancy in following the suggestion. In the same way President Babcock carried advice from the Manufacturing and Case and Can committees to Jersey Standard.

The amount of influence exercised by the committees, even the Executive Committee, over the many companies varied. Contractual obligations, the degree of ownership of the companies by the participants in the Trust, the personalities and abilities of the managers, and the exigencies of the moment all had an effect on the way in which the reins were held.

Standard Oil executives never succeeded in eliminating minority holdings in many companies associated with the Trust. The rights and feel-

ings of stockholders outside the Trust had to be considered in some twenty-six of the forty original contributory firms in 1882. Within ten years, all the outside shares in sixteen of the twenty-six companies had been acquired by the Trust, and additional, although not all shares, of three others were purchased, while seven other companies had been liquidated. In the meantime, however, shares of other companies, in many instances only a portion of the stock, had been acquired. Almost all the holdings in the subsidiaries of the corporations in the Standard Oil combination had been transferred directly to the Trust between 1888 and 1892. Since from 1890 onward many Standard Oil officials personally bought shares to qualify as directors in affiliated companies rather than have the Trustees merely transfer title, the Trust held all the shares in only thirty-four of the ninety-two companies on its books by December 31, 1891. Even if the stocks of the directors in the Trust be added to those of the organization itself, there remained twenty-nine companies in which its holdings were less than 100 per cent. Minority interests needed to be considered in all of these, in some more than others.[39]

Some companies were operated to a large degree independently of the Executive Committee. For example, the committee never exerted its power over the Vacuum Oil Company, although the Trust held 75 per cent of the shares. The top executives of that company were not among the Trustees of the Standard Oil Trust, but, perhaps in accordance with an agreement made when the Standard Oil combination acquired the shares in Vacuum, Hiram B. Everest and C. M. Everest were always chosen as directors and respectively as president and vice-president of their own company. As a matter of fact, the Vacuum Oil Company was run almost completely as C. M. Everest decided. He was outstandingly able and was respected by the Standard Oil Trustees. According to the sworn testimony of Henry Clay Pierce, he too was granted complete freedom to manage his company under the original agreement which gave the Standard Oil combination an interest in the Waters-Pierce Oil Company.[40] His relation to Standard Oil is discussed subsequently.

Instances are not lacking of objections to recommendations by committees and of outright refusal to co-operate on the part of companies, even when 100 per cent of their stock was held by the Trust. In spite of repeated suggestions from the Cooperage Committee to the Pratt Manufacturing Company that its barrels used for domestic trade could be prepared more cheaply by George H. Hopper's department than by the com-

pany, until 1886 at least Pratt executives refused to entrust the operation to the expert. As late as 1889 The Atlantic Refining Company was still opposing all efforts to place all its barrel preparation at its paraffin works and naphtha plant under Hopper's supervision.[41] Doubtless respect for individual feelings and acquiescence on more important matters by local management induced the Executive Committee to refrain from pressing smaller issues.

A more important restriction was voluntarily imposed as a common-sense means of attaining wholehearted co-operation among the executives of the combination. Even in the case of companies 100 per cent held, control was not exercised autocratically. Committeemen, including representatives of companies directly concerned with a policy, arrived at decisions through discussion and compromise; unanimity was earnestly sought and usually achieved. That practice drew heavily upon the tact and patience of the various chairmen, especially John D. Rockefeller as presiding officer of the Executive Committee. Typical of his calm tact was a note to W. P. Thompson of Ohio Standard in 1885 suggesting that a question be left to rest for a time: "There has been so much discussion on this, and some warmth."[42] After decisions had been reached, careful consideration was given to the feelings of executives who would be affected. The implementing of decisions never took the form of orders, undoubtedly for legal as well as personal reasons, but went out as requests, suggestions, and recommendations, a practice still followed in the Jersey Company.

In many instances acquiescence was assured through consultation even before recommendations had been made. "I have conferred with all the parties that are, as I think, likely to have opinions or feelings upon this subject, and the recommendations that I make are satisfactory to them,"[43] wrote G. H. Hopper when asking the approval of the Executive Committee for suggested changes in the operation of the old barreling yard of the wholly held Pratt Manufacturing Company at North Tenth Street, Brooklyn.

The committee system could not possibly work without hitches, but extant papers testify that vigorous men labored sincerely and diligently to minimize them. When Charles Lockhart was asked to become a member of the Cooperage Supply Committee in 1882, he refused on the ground that he had a personal interest in a firm which supplied staves and barrels to the combination, a fact which he considered disqualified him to serve.[44] During the same year W. P. Thompson, an astute Standard Oil administrator, noted a "clashing of opinion and a great deal of

individuality" in the Manufacturing Committee, a "tendency to seek for success in forcing personal views" that might "be detrimental to correct conclusions and eventually lead to such strong personal antagonisms" as would "mar the efficiency" of the group.[45] Over the years he could have multiplied examples of clashes about policies and the choice of executives.

Through the deliberations of the advisory committees and consultation with those in charge of separate companies, top managers attempted to work out a compromise between centralization and too loose local autonomy. "You gentlemen on the ground can judge better than we about this matter," wrote J. D. Rockefeller to W. P. Thompson on one occasion, "but let us not drift into arrangements where we cannot control the policy." Yet on another occasion Thompson, in describing the qualities for a man to take charge of marketing in Louisville, stated the case for delegation of responsibility: "He should be big enough to run the entire business subject only to general advice on general policy. It is too big and complicated to be run at arm's length."[46] At 26 Broadway the Executive Committeemen and their associates laid down general policy, often on recommendations from the field, leaving the vice-presidents and general managers of operating companies to carry out the ideas for "the general interest" as they saw fit.

In order to assure maximum efficiency in field operations the Executive Committee often selected two men of complementary abilities. Fussily meticulous George F. Southard was elected vice-president and general manager of The Solar Refining Company in 1886, and the superintendent chosen was the young but far more aggressive and inventive John Wesley Van Dyke. When members of the Executive Committee wanted to hasten the completion of the new refinery at Whiting, Indiana, in 1890, they sent out the impetuous, driving James Andrew Moffett to work with slow and systematic William P. Cowan. Thus, both achievements and suggestions by operating executives were a fusion of efforts and ideas.

Agreement between top executives and field managers was not always easily reached. Both divergent points of view and conflict of aggressive personalities generated heat. The situation of Ohio Standard during the middle eighties is a case in point. In 1885 the Executive Committee agreed with the Manufacturing Committee that Cleveland's requests for an increase in the number of its stills should not be granted in "the general interest." With this point of view the executives of Ohio Standard disagreed so strongly that its vice-president, W. P. Thompson, decided

to resign at once.[47] Perhaps only his promotion to the new Domestic Trade Committee persuaded him to stay with the combination another few years.

On becoming a member of that "general committee" late in 1886, Thompson was warned not to participate any longer in management of the local business in Cleveland. The fact that he had been earlier characterized as "arbitrary and exclusive," and that Frank Rockefeller, recently elected a vice-president of Ohio Standard, soon complained of interference from New York, might lead one to assume that Thompson was exercising unreasonable control over Cleveland; in fact, Frank Rockefeller criticized his associates rather freely and generally lacked the capacity to work harmoniously with others, a characteristic which his brothers possessed in high degree. That executives of Ohio Standard were not a closely knit group at that time is indicated by a frank letter from F. B. Squire, later vice-president of that company, to the president of the Trust in 1889: "I doubt if ever I shall be happy or contented in Cleveland, there is so much jealousy and strife that it is scarcely worth the battle."[48]

In marked contrast to the frictions and jealousies in Cleveland was the remarkable team play of the Standard Oil executives in general. Their devotion to the organization and their understanding of and consideration for each other were unusual. J. N. Camden, expressing his willingness to assume any position assigned to him which would be favorable to the "new deal" in 1882, wrote that he had "never known so many persons associated together in varied and important matters, so uniformly considerate and kind to each other and generous in overlooking mistakes and faults to which all are liable."[49] Given John D. Rockefeller's strict way of life, he must be credited with both restraint and foresight for his aid to John D. Archbold in fighting the latter's desire for alcoholic liquor, a weakness which distressed his associates. Their sympathetic hope that he would overcome his "unfortunate failing" was amply fulfilled, and Archbold became the sober and able leader of the combination in all but official name after 1895.[50]

In spite of many differences of opinion, when W. P. Thompson resigned in 1889 to become head of the National Lead Trust, he expressed the highest respect for John D. Rockefeller and his associates as well as pride in the Standard Oil Trust. "I have been identified with you and the other gentlemen for now nearly fifteen years in building and developing the greatest commercial organization of modern times," he wrote. To Thompson it was a matter of "great pleasure to know that in all of this

period of earnest, and sometimes aggressive active work," his associates, "with scarcely an exception," had been "uniformly kind, considerate and generous."[51] And his experience was not unique.

Standard Oil executives were certainly aware in the 1880's, as many public and private administrators are now, that decision making by consultation and agreement has advantages and disadvantages. It is often a painfully tedious process. Opportunities are occasionally missed through delay or adoption of compromise measures. Relatively few men have the patience to preside over and to listen to interminable discussion, together with the ability to come out at the right moment with a tactful, yet effective compromise, as Rockefeller often did. Against those disadvantages must be weighed the fact that the consultative procedure normally permits the weighing of evidence advanced by all parties concerned in a decision, especially the views of experts and of those who will execute the policies adopted. The truly significant factor in the Standard Oil case, however, was that the making and execution of decisions through conference and suggestion was essential to unity and to co-operation in a business managed by recently competitive, aggressive individualists.

THE CENTRAL STAFF

The clerical force and the number of departments at the headquarters in New York grew with the committees and the increasing volume of business of the Standard Oil Trust.[52] Rockefeller and his associates could no more perform their duties as top managers without the assistance of the advisory committees than a general could work toward his objective without staff officers. And the advisory committees depended upon a clerical force—roughly comparable to privates and noncommissioned officers—to aid them in fulfilling their functions.

Singularly amorphous in the early eighties as a consequence of previous division of offices between New York, Cleveland, and other cities, not to mention two score of companies, the central administrative organization can be perceived with some clarity only after the first general salary records were drawn up on January 1, 1886. The process of developing the system was decidedly evolutionary, since even at that date all functions performed had not yet been formalized into departments. The key to the creation of a clear-cut administrative organization was the erection of a headquarters building which could house all the personnel needed. Occupancy of such an edifice at 26 Broadway occurred on May 1, 1885.

In accordance with a plan to erect an office building for the entire

central administration of the Trust and its affiliates, real estate valued at $468,793 was purchased between 1883 and 1885. The land included the site of the former home of Alexander Hamilton. At a cost of $952,906 a nine-story structure, which at once became a famous landmark on lower Broadway, was erected between February, 1884, and July, 1885.[53] At last the top managers of Standard Oil enterprises were all located in one central office building where they could single-mindedly pursue the oil business—even at lunch in their private dining room. It was appropriate that the property at 26 Broadway was vested in the Standard Oil of New York.

A series of circumstances led the New York Company to play the role of central banker for the entire combination. William Rockefeller, the able and affable president of New York Standard, had served as the chief intermediary of Standard Oil with the New York banks since 1865. The foreign marketing activities of the corporation and its domicile in the leading money market of the United States also made New York Standard a natural choice for the leading part in banking activities. The Trustees deposited much of their surplus funds with New York Standard's treasurer, who also accepted domestic drafts, entered deposits for associated companies, and made loans to them. When short-term credit was needed, the Standard Oil Company of New York applied to local banks. When funds on hand grew to sizable proportions, the treasurer began putting them into the call loan market, especially in the late eighties.[54]

As shown in Table 6, at the beginning of 1886 only two staff units —auditing and legal—were on the payroll of the Trust itself. In all other cases cited, salaries of either the heads of departments, or their clerical force, or both, came out of New York Standard funds, directly or indirectly. The offices of Hopper, Heye, Paine, and Waring operated as agents of many companies in the combination and paid the salaries of their respective staffs, including the head, out of commissions received prior to passing profits to the "General Accounts" of the New York Company. Other corporations in the Trust may have shared the expenses of the advisory committees and of such departments as cooperage, domestic trade, and inspection, but there is no available evidence of such practice before 1889. Only one service unit for "the general interest" was located entirely outside the New York area—the Printing Department under Ohio Standard in Cleveland—though much of the pipeline staff worked in the offices of the National Transit Company at Oil City.

Such central administrative units as existed at 26 Broadway in 1886

had diverse origins and assumed their prevailing form at different times. The Legal Department of the Trust really began with the appointment of S. C. T. Dodd as general solicitor for the Standard Oil alliance in 1881. Centralization of auditing occurred in 1885, when the Cleveland office was informed that whatever checking and supervision it exercised over trans-Allegheny companies in the combination should be entrusted to Joseph Bushnell, general auditor in New York. The Crude Stock Department had its beginnings in the purchasing operations of J. A. Bostwick & Company prior to 1870, but Henry Lewis, who purchased crude oil for Ohio Standard, did not move to New York and assume responsibility for

Table 6 LIST OF MAJOR STAFF UNITS OF THE STANDARD OIL COMBINATION, 1886

Dept. or Office	*Head*	*Salary Paid by*
Auditing	George H. Vilas	Standard Oil Trust
Legal	S. C. T. Dodd	Standard Oil Trust
Crude Stock[a]	Henry Lewis	Standard Oil Co. of New York
Cooperage	Ambrose M. McGregor	Standard Oil Co. of New York
Domestic Trade	George F. Gregory	Standard Oil Co. of New York
Southern and Western Domestic Trade	Wesley H. Tilford	Standard Oil Co. of New York
Chief Oil Inspector	George M. Saybolt	Standard Oil Co. of New York
Barrel Preparing	George H. Hopper	Standard Oil Co. of New York
Lubricating Oil and Paraffin Wax	O. T. Waring	Standard Oil Co. of New York
Lubricating Oil, Western Sales	Silas H. Paine	Standard Oil Co. of New York
Foreign Barrel	C. F. G. Heye	Standard Oil Co. of New York

[a]Later known as Crude Purchasing and Carrying.
Source: SONJ, Salary Bk. A; Consol. Accts. of S. O. Trust, 1882-1886, balance sheets of New York Standard.

this function for the combination until 1885. Even then companies specializing in manufacturing lubricants made their own purchases for the most part, and the Lewis department relied on the Seep Purchasing Agency, attached to National Transit, to execute orders to buy. The departments of McGregor, Tilford, Waring, Gregory, and Heye originated in the Cleveland and New York offices of Ohio Standard during the late seventies. Heye's Foreign Barrel unit affords an excellent example of changing functions without change of name: at first the department was concerned with buying and reconditioning secondhand barrels abroad; after the middle 1880's it chartered and scheduled ships, recorded sales of

Standard Oil exports, and received payment for them; a more accurate title would have been Foreign Shipping and Sales. As mentioned above, Hopper joined the New York Company in 1882, and George M. Saybolt began his program to standardize oil-inspection practices for the whole combination a year later.

Far from all staff functions had been crystallized into departments by 1886, and those that had emerged reflected for years to come the diverse origin and individualistic personalities of their heads. Much of the staff work for export trade operations was carried on in the office of T. C. Bushnell until his death in 1902. Though Silas Paine moved his headquarters and clerical force from Cleveland to New York in 1885, his Lubricating Oil, Western Sales Department, continued to be independent of Waring's unit for Eastern and foreign sales until long after 1900. Similarly, the Gregory and Tilford departments, both concerned with domestic trade, continued separate for many years. Top executives obviously were willing to forego some of the advantages of centralization in order to assure the best work from key men on the second and third echelons of administration.

If persuasion was the avenue to team play in the Standard Oil Trust, accounting was the prod to intra-Trust competition. With a few exceptions, every operation in every company was expected to show a profit. Separate accounts were set up to reveal the financial state of affairs in the numerous departments and companies. Semiannual balance sheets were required. Average costs were carefully computed to four places after the decimal point. Superintendents, department heads, and executives of all categories were judged on the basis of costs and profits. Promotion came to the man who reduced the former and increased the latter in his division or company. At the beginning the accounting was far from modern cost accounting—really little more than bookkeeping—but such as it was, it afforded an instrument of control and a stimulus to competition within the Standard Oil combination.

For effective comparison, accounting procedures needed to be uniform throughout the organization. Directed by George H. Vilas, the Auditing Department of the Trust itself was intended to assure the desired uniformity, but progress toward the goal was slow. Pipeline companies, lubricating oil manufacturers, general refiners, and marketers all had accounting problems peculiar to their particular functions. The National Transit Company acted as a holding company from its inception, and its bookkeepers simply merged the assets and liabilities of subsidiaries

with those of the parent corporation. All the companies originally brought into the Trust formerly had auditors of their own, some of whom were retained for years thereafter. The quasi-independent Chess-Carley Company, Waters-Pierce Oil Company, and Consolidated Tank Line Company each maintained its own auditors throughout the 1880's. In extenuation of the marketers, it must be admitted that no attempt was made to provide them with standardized report forms or an accounting manual until 1884.

In many instances finance was the real key to control. It locked some doors and opened others. Through its power to approve or disapprove all expenditures for construction involving $5,000 or more, the Executive Committee effectively controlled the rate of expansion of all units in the Trust. For example, the money subscribed for shares of the Waters-Pierce Oil Company in 1878, plus sums extended to it on notes and book credits by Ohio Standard and others, undoubtedly contributed materially to the rapid expansion of that marketing company. In order to carry out its ambitious program in the early eighties, the National Transit Company issued bonds, $2,408,000 of which were owned by the Trust until 1884. F. D. Carley probably behaved with more restraint than he would have, had he not personally owed $207,196 to Ohio Standard by the end of 1881, as security for which he had deposited his shares in the Chess-Carley Company and the Consolidated Tank Line Company.[55]

Accurate decisions and effective control depended very largely upon the information available to the members of the Executive Committee. "It is the success of any large business to know what the other man is doing, as well as yourself," Standard Oil's James Donald later emphatically testified.[56] He was echoing a conviction of top management: from the inception of the Standard Oil Trust the Trustees had sought to develop an accurate and comprehensive information service upon every topic touching the conduct of their business. To a major degree top executives of the Trust and managers of many of its companies acted upon information concerning all phases of their wide-flung oil business collected, evaluated, digested, and disseminated by New York Standard's clerical force.

To keep posted regarding their own business the Trustees naturally relied upon their own organization. A daily "crude oil report" was sent to the Executive Committee. It contained the latest information upon new wells, total production in the United States, stocks in storage, Standard's holdings, runs from tanks at wells, deliveries, and new purchases.

It was a composite of telegraphic reports to the representative of the National Transit Company at 26 Broadway and of the buying and accounting recorded in the journals and ledgers of the Crude Stock Department headed by Henry Lewis.[57] In 1881 most of the refineries in the combination began making monthly cost and yield statements on kerosene, naphtha, lubricating oils, and wax. At varying times for the different products, monthly, quarterly, semiannual, and annual comparative statements were drawn up by "H. C. Folger, Jr., Clerk," and forwarded to H. H. Rogers, chairman of the Manufacturing Committee. Annual analyses of the "Manufacturing Business" of the Trust began to be compiled in 1884. Statistics upon costs and results of marketing of Standard Oil products were inadequate until Stephen Tydeman "originated . . . in its simplest form" the monthly Barreling and Marketing Report, with accompanying rules for "distribution of expenses," after he became secretary of the Cooperage Committee in 1884.[58]

Concerning developments in the oil business outside the Standard Oil combination a flood of information, much of it of dubious accuracy, poured in upon the committeemen. The data digested by the executives and their staff covered a very wide range of economic and political activity. Though only two Standard Oil companies were directly participating in sales abroad—New York Standard through Meissner, Ackermann & Company, and Thompson & Bedford Company, Limited, through its agents—the leading committees were concerned about the reception and conditions of sale of their products everywhere. Hence, they collected information on all national, provincial, state, and municipal enactments dealing with inspection, storage, trade-marks, tariffs, and commercial law in general. Foreign production of crude oil, especially in Galicia and Russia, already affected prices of lubricating and refined oils in some areas and threatened to become a much larger factor in wider markets. Facts on the manufacture and sales of competing companies and products—at home and abroad, of petroleum and other raw materials—were assiduously collected and diligently evaluated. The environment of the Standard Oil Trust was the whole world.

The sources of the outside information were diverse. Many data came from employees of the various companies in the Trust and from the brokers and merchants with whom Standard Oil dealt. Oral reports and letters, newspaper clippings and copies of articles from magazines, offprints and digests of laws all contributed grist for the mill at 26 Broadway. Newspapers of New York City and of the Oil Regions, particularly

the *Oil City Derrick*, were perused from day to day. Among trade journals the New York *Oil, Paint & Drug Reporter* was probably followed more closely than any other, though pertinent articles in the *Railroad Gazette*, *Railway Review*, *Proceedings of the American Society of Mechanical Engineers*, and other technical journals often yielded valuable information. Good books on the petroleum industry were very few. The reports on petroleum in the surveys of *Mineral Resources* issued by the federal government and the various states constituted the foundation for a whole body of collected data.[59]

Current facts upon sales and marketing techniques of competitors were the most difficult to collect. There were neither public nor private sources of such statistics in the industry; thus each business had to build its own body of information about its competition—customers, price, and volume. Without these data executives would have had no means of evaluating their relative standing in the market as a whole or in specific areas. Moreover, as a result of its enormous plant investment and high fixed costs, it was more important to the Standard Oil group than to any of its competitors to have available accurate marketing information.

Standard Oil officials gradually worked out an intelligence system covering the entire United States. Through control of the pipelines they knew the amount of crude oil purchased by almost every competing refiner.[60] Refining techniques were uniform enough that the percentages of naphtha, kerosene, and other products from Pennsylvania-grade petroleum could easily be calculated. But such an approach yielded only incomplete data and no more than a rough estimate. Hence, Standard Oil executives required every sales representative to report his own *and* all rival oil receipts in his area. In some states, at least, the system was in operation during the early eighties, and at some now unknown date the procedure was formalized. Salesmen kept card files on their own and potential customers, especially hardware and grocery stores selling refined oils. Information on outside receipts and estimated sales went forward to subdivision and division headquarters for marketing. Forms were supplied for recording cars received by competitors—date shipped, date received, shipper, point of departure, consignee, destination, type of product, and identification of railroad car.[61] Such reports formed the nucleus of those forwarded to 26 Broadway by the major marketing units and provided the data for judgments by the Domestic Trade and Executive committees upon competitive sales in different areas and in the United States as a whole. The criticisms and drawbacks of the system

constituted problems in domestic marketing and public relations, to be discussed later.[62]

During the years 1881-1892, largely within the first five years, the executives of the Standard Oil combination had improved and formalized an efficient administrative organization. Both the legal unifying agency (the Standard Oil Trust) and two companies (Jersey and New York Standard), soon to loom largest in its affairs, had been created in 1882. Upon foundations laid in the 1870's, and in response to the demands of the times, top managers had worked out a system of committees to aid the Trustees in integrating and co-ordinating the business of all the companies under their direction. To facilitate the collection and digestion of information needed for making recommendations, formulating policy, and maintaining controls, they had built up a centralized staff drawn largely from the Standard Oil Company of New York and housed in a magnificent new office building. "We are not free from the annoyance and trouble incident to this smooth running business, but it seems to me we have every reason to be grateful when we compare it with any other," wrote John D. Rockefeller to Benjamin Brewster in 1886.[63] The most important elements basic to that optimistic view were the men who made top decisions and the administrative mechanism they had created to implement their policies. The pattern for Standard Oil was set for a generation. The lessons learned and experience gained had far-reaching effects on the history of American business.

Chapter 4

Operational Honeymoon, 1882–1885

DURING THE years 1882-1885, when Rockefeller and his associates were setting Standard Oil's administrative pattern for all the years to 1911, the Executive Committee enjoyed almost unparalleled freedom of action in implementing its operational policies. The demand for petroleum products continued to expand, as theretofore. After the amalgamations, competition, though present, offered less serious immediate threat to Standard Oil's dominance than ever again, in either foreign or domestic markets. Supplies of crude oil were always ample. Because the area of production in the United States was still concentrated in the geographically limited Appalachian region, Standard Oil men experienced no major difficulty in carrying out their blueprint for overwhelming leadership in gathering, storing, and transporting petroleum. Favorable circumstances also facilitated the partial execution of plans for reducing costs of manufacture and for improving marketing techniques in domestic trade. The Trustees, intent upon the prosecution of their policies, could shrug off or ignore attacks in the courts and in the press because serious legislative and judicial pressures upon the combination had not been built up prior to the late 1880's. Measures to integrate the numerous companies and functions into a systematized, unified operating organization were vigorously pursued.

To one looking back, the years under review appear to have been comparatively easy and successful for Standard Oil, but during the period its managers never felt free from pressing problems. Relations with employees, discussed in Chapter 20, were matters of concern from time to time to managers of all functions. Marketers worried about threatening competition and the limitations of their own organization. Refiners and auxiliary manufacturers continually strove to systematize operations, to reduce costs, and to maintain quality satisfactory to the markets. Issues involving the purchasing, gathering, and storing of crude oil, plus the task of

completing the trunk lines, harried the executives of the National Transit Company throughout the years 1882-1885.

NATIONAL TRANSIT IN ACTION

Management of the multitudinous affairs of the National Transit Company, the major pipeline unit of the combination, was entrusted to a remarkable team of men. Of these the outstanding active figure was the driving, occasionally ruthless, exceedingly loyal Daniel O'Day. As general manager of National Transit he was directly in charge of the construction and operation of the trunk pipelines. In his capacity as vice-president of the affiliated United Pipe Lines, he supervised the activities of William T. Scheide, general manager of the gathering system. Neither C. A. Griscom, president of the parent company until 1891, nor J. J. Vandergrift, president of United Pipe, took an active part in management. Benjamin Brewster as vice-president of National Transit, and the actual executive head in New York, and H. M. Flagler, as a director, transmitted to the field the decisions of the Executive and the Transportation committees. More important than the two Trustees in the everyday affairs of the Transit Company by 1886 were John Bushnell, secretary and comptroller, and Charles J. Hepburn and Theodore M. Towl, the civil engineering experts on construction, rights of way, surveys, and tax matters.[1] Although it was a team operation, Daniel O'Day furnished the vital force which made pipeline men so closely knit that, according to legend, "if you stuck one, they all bled."

In gathering and storing crude oil the managers of the United Pipe Lines after 1880 had to strive to hold and to improve its position in the face of scattered competition, fluctuations in volume of production, advent of new fields, extraction in excess of consumption by refineries, and expanding stocks above ground. The tide of output began to ebb in the Bradford field during 1881, but production in southern New York rose rapidly. When the spectacular, though transitory, flood began to pour out of Pennsylvania's Cherry Grove pool in 1882, annual production of crude in that state and New York reached the unprecedented peak of 30,053,500 barrels. (See Table 7.) After that torrent of oil, Appalachian production sank rapidly. The development of numerous new pools, the expansion in southeastern Ohio from 1883 to 1885, and the opening of a field in Washington County, Pennsylvania, in 1885, no more than tempered the impact of the precipitous decrease in the Bradford yield. In spite of that decline, production exceeded consumption until 1885; oil in storage

Table 7 ANNUAL CRUDE OIL PRODUCTION IN THE UNITED STATES, 1881-1885

In barrels of 42 gallons

Year	*Pa. & N. Y.*	*Ohio*	*W. Va.*[a]	*Cal.*	*Ky. & Tenn.*	*Total*
1881	27,376,509	33,867	151,000	99,862		27,661,238
1882	30,053,500	39,761	128,000	128,636	·	30,349,897
1883	23,128,389	47,632	126,000	142,857	4,755	23,449,633
1884	23,772,209	90,081	90,000	262,000	4,148	24,218,438
1885	20,776,041	661,580	91,000	325,000	5,164	21,858,785

[a]Rounded figures only are available.

Source: *Mineral Resources, 1899,* 9-10. The production of crude oil in California was so far away from the center and the petroleum was so different from Pennsylvania-grade oil that it exerted little influence upon the situation in the Appalachian region.

rose from 17,145,104 barrels at the end of 1880 to more than 39,000,000 in August, 1884, and was still in excess of 33,500,000 barrels by 1886. (See Table 8.)

As they struggled to adjust to the changing producing scene, Standard Oil's gathering and storing contingents performed some feats which elicited praise even from critics. The United Pipe Lines came so near to carrying a pipe to every well that later commentators forgot delays and failures. In May, 1882, United Pipe granted the largest single contract for tankage recorded to that time—provision for 3,255,000 barrels of oil. To handle the output of the Cherry Grove pool the company prepared for 40,000 barrels daily; when the flow declined to a trickle within a year, United Pipe lost money and was burdened with excess tanks, pipes, and pumps. Undaunted, O'Day's men inaugurated operations in the Macksburg area in 1883, responded to calls in all the new pools in

Table 8 PIPELINE RUNS, SHIPMENTS, AND STOCKS IN STORAGE IN THE APPALACHIAN REGION, 1881-1885

In barrels of 42 gallons

Date	*Runs for Year*[a]	*Shipments for Year*[a]	*Stocks in Storage*[b]
1881	27,376,509	20,284,235	25,761,051
1882	30,053,300	22,000,314	34,335,144
1883	23,128,389	21,979,369	35,715,565
1884	23,665,892	23,658,229	36,872,892
1885	21,678,357	23,725,489	33,539,038

[a]Runs were the totals of amounts credited at field storage tanks to owners of wells. Shipments were the totals of amounts shipped from field storage tanks for delivery to purchasers of oil.

[b]Figures on stocks are for the end of each year.

Source: Derrick's *Handbook,* I, 808-809. Stocks in storage reached a high point of 39,086,004 barrels on Aug. 31, 1884.

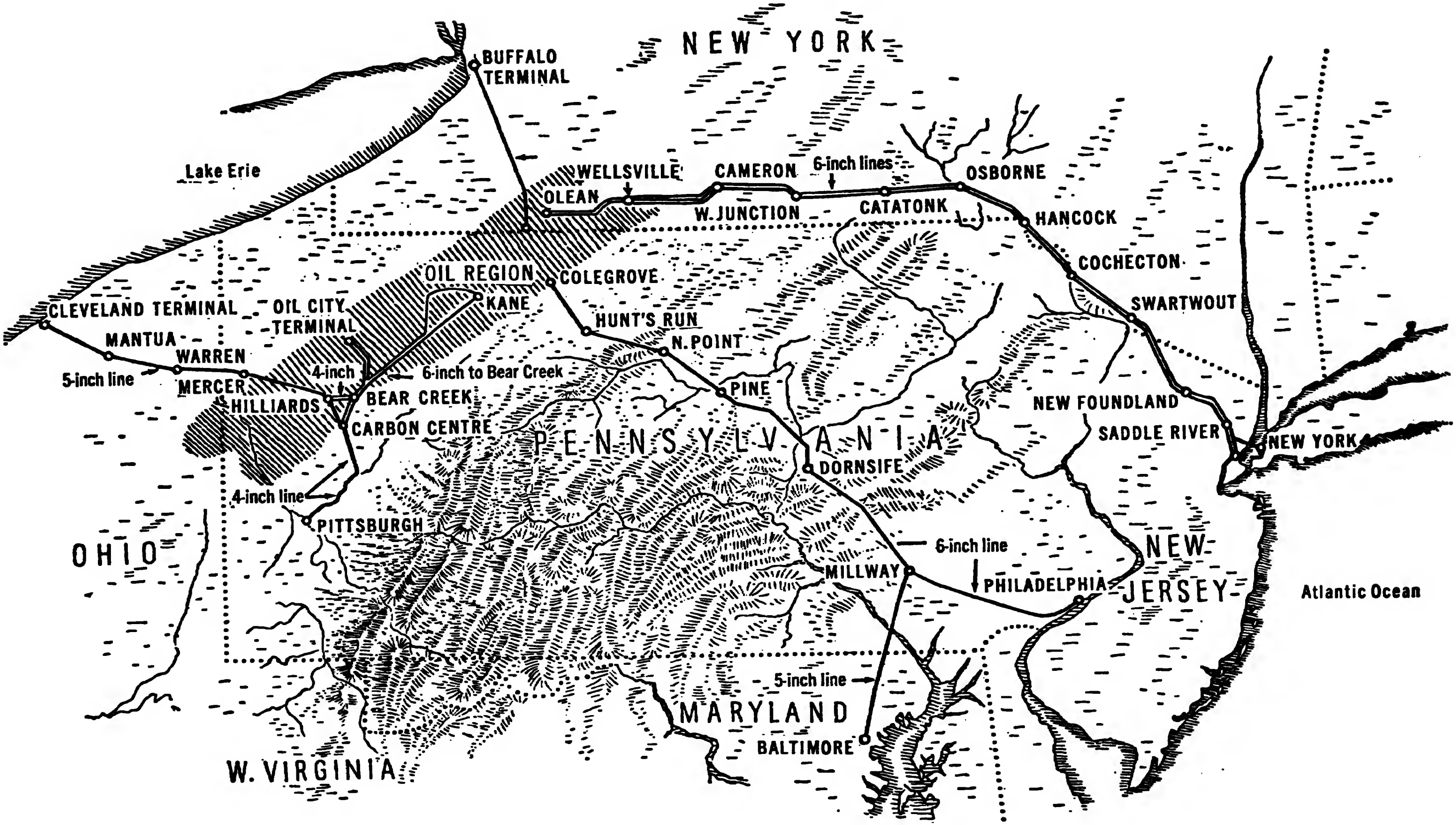
the Bradford area between 1882 and 1886, and began to lay pipe and erect tankage in Washington County in September, 1885,[2] thereby establishing the nucleus of the future South-West Pennsylvania Pipe Lines.

In spite of gargantuan exertions, United Pipe Lines men failed to keep pace with their ambitions. Two years elapsed between the advent of the pioneer well in Allegany County, New York, and the connection of Standard Oil's gathering system to wells in the area. The rival Ohio Transit Company was active in the Macksburg field before O'Day began his drive for supremacy there, and the first shipment of oil from southwestern Pennsylvania went by tank car six months before a United Pipe Lines tank had been built. Storage facilities erected by outsiders, called "private tankage," totaled more than five million barrels by the end of 1884.[3]

While the United Pipe Lines was successfully maintaining its dominant position in the gathering and storing of crude oil, its parent, National Transit, was completing trunk pipelines to almost all Standard Oil refineries. In December, 1881, O'Day's men finished the first pipeline (six-inch) from the Oil Regions to the Atlantic coast. Through it, Jersey Standard's Bayonne Refinery received oil direct from the Oil Regions via Olean, and, before the first line was completed, a parallel line was being laid. The six-inch line to the Philadelphia plants began functioning in 1882 and the five-inch from Millway, Pennsylvania, to Baltimore in 1883. In 1882 National Transit supplemented its three-inch line from Olean to Buffalo by the purchase of a rival, the four-inch Buffalo & Rock City, and within another three years a trunk line was supplying the Parkersburg Refinery of the Camden Consolidated Oil Company. National Transit men had seized and used fully every advantage of the pipeline revolution.

In the course of building the line from Olean to Bayonne, National Transit met problems similar to those confronting railroad builders as well as other pipeline men.[4] Surveys had to be made, right of way leased, a ditch dug, pipe purchased and laid, a telegraph line set up, buildings erected at pumping stations, machinery installed, fresh water supplied for boilers, and the entire working force kept busy. By agreement the surveyors located as much of the line as possible along the right of way of the Erie Railroad, a measure which kept costs of hauling building materials and coal for the pumping stations to a minimum. The line ran almost straight—over fourteen rivers, twenty creeks, and the divides of eighty hills and mountains, the highest being over 2,400 feet.

In accordance with orders to win the good-will of landowners along



National Transit Company's Pipelines, 1885

the right of way, a policy generally followed by Standard Oil men, lease men were generous in prices paid and in adjustments for damages. Their task was easy in New York State but difficult in New Jersey. Only after agreements with the Midland, Erie, and Lehigh Valley railroads, a successful combat with the Central Railroad in the legislature, and the payment of high prices to private individuals in Bayonne, was a right of way finally acquired.[5] Not until March 28, 1882, was the last signature secured for the leases from the Saddle River station to the Hudson River at Shadyside, enabling a connection to be made with the Crosstown pipeline and the East River refineries. When other oilmen met similarly expensive difficulties in obtaining rights of way, they blamed "that man Rockefeller" or the Standard Oil "octopus"! O'Day had no such recourse.

Another policy of National Transit men was to build for permanence. Though most of the digging had to be done by pick and shovel, they decided to lay the pipe in a trench at least eighteen inches deep, except over solid rock. In need of building cheaply and hastily, the rival Tide-Water's men had sunk their line only when it crossed tilled land. As a consequence, changes in temperature caused whipsawing of the pipe, which then had to be buried.[6]

Other aspects of the policy of building thoroughly, of learning from Tide-Water's mistakes, and of Standard Oil's own experience with pipelines were numerous. Construction was carried forward from both Bayonne and Olean. Workers and foremen were drawn from the United Pipe Lines, from Tide-Water, from farms and villages along the right of way, and from among immigrant Irish. Since Vandergrift and his associates of Scotch antecedents apparently had hired many men of their own religious belief, it can be said that the pipelines were built and operated by Paddies and Presbyterians. A gang of twenty-eight men, exclusive of the ever-present timekeepers and telegraphers, was expected to join and lay 175 to 200 eighteen-foot lengths of six-inch pipe per day. The eleven pumping stations between Olean and Bayonne were located about twenty-eight miles apart and erected under contract by one John O'Shea. Each consisted of three brick buildings—a boilerhouse and 115-foot stack, a combined machine shop and storehouse, and a smaller house between the other two for the use of the foremen and telegraphers. Fresh water for the boilers came from specially drilled artesian wells. Duplicate boilers, engines, and 800-horsepower Worthington pumps were installed. The pipes were constructed to withstand a pressure of fifteen hundred pounds per square inch,[7] though the gauge at the station normally reg-

istered no higher than nine hundred. The gauges were read in the light from kerosene lamps, used until the installation of electric lights in 1889. One intake and one output tank were erected at each station, while pipe looped around each unit made it possible to by-pass the tanks if desired.[8]

Three tank farms, prototypes of others in Pennsylvania, formed the chief immediate sources of oil supply for the pipeline to Long Island and Bayonne. Begun in 1880 but largely put up in 1882, over 300 tanks with a capacity exceeding 10,000,000 barrels were located near Olean, 79 with a capacity of 2,765,000 barrels at Elm Valley near Wellsville, and 9 holding 315,000 barrels for emergency use at Unionville on the New York–New Jersey boundary line. To minimize leakage these tanks were coated inside with shellac. Evaporation was lessened by making tank roofs of wood covered with sheet iron to prevent warping, collecting water, and rusting. Better fire protection than previously was provided by spacing the tanks from 350 to 400 feet apart instead of the earlier 200 feet, by having water pumps at each storage point, and by keeping small cannon on hand to puncture burning tanks in order to release oil.[9]

Operational problems involved everything from personnel to wildcats. On the New York division the pump station force consisted of a foreman, two engineers, two assistant engineers, four firemen, and two telegraphers working in two twelve-hour shifts. To pump the 24,000 barrels going through the lines daily, each fireman had to shovel 5,350 pounds of coal during his tour of duty. Small leaks and breaks in pipelines were repaired by pipeline walkers, who tapped the telegraph line for help in emergencies. A walker covered the twenty-eight to thirty miles between stations in the course of two days, if he did not find too many breaks and did not encounter too many wildcats and rattlesnakes. Shortly after operations had begun in the Olean-Bayonne line, in order to reduce evaporation losses arising from pumping oil in and out of tanks at each station, the pumps were synchronized with the flow so that the oil could be boosted along without recourse to the tanks at all. Telegraphers read the gauges and made daily reports on the volume of oil passing each station. To keep the pipe cleared of paraffin, a patented scraper, used earlier by Tide-Water, was sent through the line at periodic intervals. That thirty-pound, six-foot, socket-jointed, brass gadget, nicknamed the "go-devil," resembled a double umbrella with attached leather discs. It was also utilized instead of water, the medium first used, to separate two different grades of oil in the line.

While administering these operations, O'Day had to bargain with pipe

manufacturers and to supervise the laying of new pipes. Small wonder that he enthusiastically endorsed the appointment of a general superintendent and divisional superintendents for each trunk line late in 1882.[10] The new arrangement obviated delays and improved efficiency.

By the middle eighties, systematic administration characterized every phase of Standard Oil's gathering, storing, and transporting of crude oil. When a producer requested a run from the tank at his well through that part of United Pipe's three thousand miles of lines which was laid to his property, one of the company's 107 gaugers measured ("strapped") the tank. He wired the measurements to his district headquarters, where clerks referred to tables on which the dimensions and capacities of all tanks in the area were recorded. A clerk then noted the run in barrels, made the necessary deductions, and registered the credit balance of the well-owner. The receiving company issued an oil certificate for each thousand-barrel lot and credited fractions of that amount on its books. Batteries of clerks, bookkeepers, and accountants kept track of oil received, certificates issued, gathering and storing charges, and oil forwarded out of the gathering division's custody. United Pipe's 135 pumping stations,[11] from the rude huts in remote areas to the attractive, large units at Tarport, Duke Centre, Richburg, and Kane, kept the oil moving to storage or to the trunk pipelines. Efficient telegraphers kept the chief offices at Bradford and Oil City constantly abreast of the situation and reported daily to New York.

Charges for gathering and storing the oil were stabilized. Since 1879 local pipage from well to storage had remained at twenty cents per barrel, whether the oil was carried ten feet or ten miles, on the same principle as the federal government's uniform rates for letters carried anywhere within the United States. When the oil was received, United Pipe deducted from the producer's run the amount due the owner of the land as royalty and also 3 per cent of the volume as an allowance for shrinkage in transit, evaporation in storage, and B. S. & W. (bottom settlings and water). Managers of the pipeline company purchased enough oil from time to time to make sure of delivering merchantable oil to the full value of all outstanding certificates and credit balances. Storage was free for thirty days; after that there was a charge of one and a quarter cents per barrel per month, payable every six months or when the oil was sold. In accordance with a Pennsylvania law of 1874, a report of amount on hand was published monthly and annually. Sampling for water content was done quarterly. Fire losses were covered by a prorata assessment—the

principle of general average—upon all owners of credit balances at a given date.[12]

United Pipe's reputation for accuracy and integrity received a tremendous boost in 1883. Early in the year allegations were publicly made in Pittsburgh that the company had less oil in its tanks than was shown by its published reports. When similar rumors continued to circulate, United's management invited all the oil exchanges to send representatives to witness the annual gauging of all tanks on September 1. After watching the operation and spending a month checking the account books, the delegates of the exchanges published a report showing that National Transit's storing facilities had a surplus of 677,807 barrels of oil over all outstanding liabilities.[13] Never again was the honesty of Standard Oil's field storage unit seriously questioned.

Stability in the rates charged by the trunk pipelines came only after a long struggle. Not only did National Transit have to complete its own system; it had to work out its relations with the Buffalo & Rock City and other small piping companies, with The Tide-Water Pipe Company, Limited, and with the railroads. Various methods were used to attain the objective.

National Transit executives utilized outright purchase in the case of the Buffalo & Rock City Pipe Line Company and several other small competitors. United Pipe bought the line to Buffalo in February, 1882, for $480,748, the approximate cost of construction. Later in the same year the lines, tanks, and appurtenances of the Union Oil Company, and the McCalmont Oil Company in Warren County, Pennsylvania, were purchased.[14] These acquisitions served to reduce "private tankage," provide much-needed storage facilities for Standard Oil, round out the United Pipe Line's gathering system, stop a rate war in Warren County, eliminate a competing trunk line to Buffalo, and cut off two of the leading contributors of crude oil to The Tide-Water Pipe Company, Limited.

Standard Oil men definitely did not desire to encourage competition from other pipelines if they could avoid it. Warden wrote to Rockefeller concerning the growth of local gathering lines in 1883: "We must prevent all such enterprises from making any headway and make it as discouraging as possible for any such to start—No difference how small such an enterprise may start, we must prevent it from taking root as far as we can do so by legitimate & fair means."[15]

Until the summer of 1883 Standard Oil men pursued a varied program in their battle with Tide-Water Pipe. The campaign consisted of com-

petitive pressures to delay Tide-Water's activity until the Standard Oil trunk lines could be completed, of overtures designed to gain influence or control over Tide-Water management, and of watchful waiting upon events. Prior to 1882, Standard Oil offered premium payments for crude oil in competitive areas and bought or leased plants which were potential purchasers of Tide-Water's deliveries in the New York area. By these means Rockefeller and his associates compelled the rival president, Byron D. Benson, and his associates to pay higher prices for the raw material and to expend considerable sums in developing assured consumers—their own refineries. Although steadfastly refusing to sell either stock holdings or crude oil to Standard Oil units, in the fall of 1881 Benson accepted from the combination a loan conditioned upon participation in Tide-Water's profits and representation on the board of directors. When Benson insisted on borrowing heavily in 1882 in order to finance expansion, a group of his company's minority stockholders, headed by H. L. Taylor, John L. Satterfield, D. B. Stewart, and John L. McKinney, vigorously opposed the decisions and the attempts to raise funds. Standard Oil executives exploited the rift within the ranks of the competitor by purchasing the gathering and storage system of Taylor and Satterfield's Union Oil Company. Archbold's payment of $15,000 to another Tide-Water stockholder and previously violent opponent of Standard Oil, E. G. Patterson, ostensibly for his good-will and agreement to cease his attacks on the combination, smacked of sharp practice, especially after Patterson soon tried to throw the Tide-Water company into bankruptcy. When that attempt failed in January, 1883, the Taylor-Satterfield faction unsuccessfully sought to wrest control from the Benson group.

After the defeat of Tide-Water's minority, Standard Oil management apparently decided to capitulate substantially on the terms previously proposed by Benson and his friends. In 1882 they had urged an agreement dividing the refining and transporting of oil in the United States, stabilizing pipeline rates, and fixing prices of refined oil. The passage of a "free" pipeline bill by the Pennsylvania legislature in 1883 eased the way for potential competing trunk lines. Standard Oil forwarded good feeling by taking 55,000 barrels of kerosene from Tide-Water early in October. Later in the month two contracts were signed. One was between the National Transit Company (plus United Pipe) and Tide-Water and the other between the Standards of Ohio, New York, and New Jersey on the one hand and refineries associated with Tide-Water—The Ocean Oil Company, Chester Oil Company, and Lombard, Ayres &

Company—on the other. Under these contracts the total business of the two groups in storing, transporting, and refining of petroleum was divided in the ratio of 11½ per cent for Tide-Water and 88½ per cent for Standard Oil. The latter also guaranteed Tide-Water Pipe and associated refiners an annual income of at least $500,000 for fifteen years, the duration of the contract. Tide-Water refineries soon entered a Standard Oil pool for selling kerosene for export. Two months after the agreements had been made, the Standard Oil Trustees bought shares of the disaffected minority in Tide-Water Pipe, 2,143½ shares out of the total of 6,250, for $536,700.[16]

Legislation undoubtedly affected the character of the settlement between Standard Oil and Tide-Water Pipe. A Pennsylvania act of June, 1883, forbade the consolidation of competing pipelines.

All groups appeared satisfied. Both minority and majority stockholders of Tide-Water made money, while Standard Oil acquired representation on the board of directors of its ally and dividends from its stock holdings. Though Rockefeller and his associates did not control the management of Tide-Water, they had influenced it and would continue to do so. Most important, a significant step had been taken toward stabilizing the costs of and profits from transportation of crude oil.

The contracts furnished the necessary basis for agreement upon pipeline rates for carrying crude oil. On January 4, 1884, within the area of competition—from the Oil Regions to the seaboard—the rate was set at forty-five cents per barrel to New York and forty cents to Philadelphia and Baltimore, exactly the same as the railway tariffs. The rates were the result of agreement with the railroads. Standard Oil's desire to keep transportation costs high for competitors without pipelines undoubtedly was a consideration.[17]

Standard Oil executives had a strong incentive for not asking the railroads to assume the full burden of loss arising from the shift in the method of transporting raw petroleum. The good-will of the Pennsylvania Railroad Company, for example, was needed on many other counts—granting rights of way for pipelines, leasing sites for and laying spur tracks to bulk distribution plants, carrying raw materials other than petroleum to refineries, hauling coal to pumping stations, and transporting refined oil, naphtha, lubricants, and waxes to market. Hence, on August 22, 1884, National Transit agreed that the Pennsylvania should receive credit for 26 per cent of the total revenue for transporting Standard's crude petroleum and manufactured products to the seaboard, whether or not a drop of crude oil went via the railway. The shoe was

then on the other foot: the railroad company was the recipient of the rebate! And the Erie Railroad was receiving similar payments from National Transit—at a rate in excess of $300,000 per year in 1885.[18]

Within another sixteen months, the National Transit Company had greatly increased its strength and extended its services. It was carrying, in its own name, crude oil from the wells to all but one major Standard Oil refinery—that at Rochester. It had bought all the properties of its own affiliated United Pipe Lines in 1884, the gathering system of the Ohio Transit Company for the Macksburg trunk line early in 1885, and, late in the same year, the Crosstown pipeline from New York Standard. Though National Transit had not been able to increase its interest in The Tidioute & Titusville Pipe Line Company to more than two-thirds, it leased and operated the properties as a part of the United Pipe Lines Division. Within the Standard Oil family, only the very short lines of the Smith's Ferry Oil Transportation Company and the Franklin Pipe Company, Limited, were not under National Transit operational jurisdiction. Meanwhile, as an outgrowth of repairing activities, the Oil City shops of National Transit had begun the manufacture of engines and pumps for pipeline operations.[19]

While Standard Oil executives were making the National Transit Company the dominant piping and storing agent of oil—a transporter and banker of oil for the producing group—they relied upon purchases in the open market for almost all the petroleum required for the refining operations of the combination. During the years 1882-1885 Rockefeller and his associates made little attempt to expand activities of their own producing companies, which were capable of supplying no more than a small fraction of Standard Oil's consumption. The overwhelming bulk of the oil for refineries of the combination came through purchases of certificates, usually on the oil exchanges both in the Oil Regions and in New York.

In 1884 Standard Oil buying of petroleum was vested primarily in two units of the combination. The Executive Committee consolidated the work of Henry Lewis & Company, the wholly Standard Oil-owned brokerage firm which had previously purchased oil for refineries in the Regions and Cleveland, with that of the Seep Purchasing Agency. Accounts of the latter had been carried in the name of J. A. Bostwick & Company since 1872; they were now transferred to the Crude Purchases Department of National Transit's United Pipe Lines Division. The Seep agency thus became practically the sole buyer for Standard Oil in the Appalach-

ian area, though a few Standard Oil lubricating specialists continued to use outside brokers. Henry Lewis was transferred to 26 Broadway to be head of New York Standard's Crude Stock Department, which coordinated the operations of Seep in the Oil Regions with those of brokers who were buying certificates for the combination in New York and occasionally elsewhere. Acting upon all available pertinent data on the world's production, storage, and consumption of crude oil, the Executive Committee transmitted to Lewis its decisions as to the amount of oil to buy and the time to buy it. He relayed the orders to brokers in New York or to Seep, who passed the word to his buyers at key points in the Oil Regions.[20] In turn Standard Oil's refineries purchased crude to meet their needs from New York Standard's Crude Stock Department.

In general, Seep's price for oil at the wells was the average between the highest and lowest prices on the oil exchanges upon any day that he made purchases, though there were two deviations from that practice. During late 1884 and much of 1885 a premium was paid for oil in the Macksburg area in order to stimulate enough drilling and production to supply the Parkersburg Refinery; the response was the expansion of runs shown above in Table 8. And from August throughout the remainder of 1885 Seep also paid a premium on oil produced in the middle and southern counties of western Pennsylvania.[21] That departure from normal procedures reflected a recognition of the superior quality of the premium oil as compared with Bradford oil, a desire to encourage drilling outside the declining northern field, and an eagerness to check growing competition from small pipeline companies at several points.

Unless Standard Oil operations on the oil exchanges far exceeded those indicated by available scattered evidence, the organization did not control the price of crude oil. In 1883, when production in the Appalachian region was approximately 23,400,000 barrels, and the average stocks in storage amounted to approximately 36,000,000 barrels, the dealings in certificates on the oil exchanges represented 6,670,213,000 barrels. Comparable figures for 1884 were 24,000,000, 37,700,000, and 11,246,542,000 and for 1885 were 21,500,000, 35,700,000, and 7,072,128,000. The consumption of crude oil by all Standard Oil refineries in 1885 was 16,066,397 barrels.[22] Although the combination occasionally purchased some reserves in excess of its current needs, evidence indicates that Standard Oil did not speculate on the exchanges and that its operations there were not a large part of the whole. Standard Oil was the largest buyer of crude oil for refining, but speculators in certificates

accounted for the overwhelming proportion of transactions on the oil exchanges. Archbold remarked to Rockefeller that the movement of crude oil prices usually followed the "temper" of the stock exchange.[23]

During the years 1882-1885 National Transit had attained the goals set for it by Standard Oil executives. It was offering collection and storage facilities to almost every producer of oil as soon as his product came from the well. By early 1886 National Transit possessed tankage for 40,166,085 barrels of oil. Of that amount, tankage for 6,000,000 barrels was not in use.[24] By means of the gathering system and over thirteen hundred miles of trunk lines, the costs of transporting crude oil to Standard Oil refineries had been reduced. Furthermore, through ownership of the pipelines the Trust gained the profits on transportation. Rates were set, so that transportation charges had become practically a fixed cost, not only to the refineries in the Trust but also to other refiners buying petroleum either from the combination or from Tide-Water, or using the railroads whose rates were stabilized too. Rebates to Standard Oil on crude oil shipments had been virtually eliminated without recourse to legislative enactment. Every phase of operations had been systematized. "No army was better officered, better disciplined, better equipped and better managed than National Transit," declared John J. McLaurin in his *Sketches in Crude Oil*.[25] Having fused their own ideas and experience with those of competitors, the managers of National Transit had carried through a technological and administrative revolution in the transporting and storing of crude oil. Through the Seep Purchasing Agency, Standard Oil constituted a ready market for oil produced. The pipeline was the conveyor belt from the wells to Standard Oil refining units. The refineries in turn had to be adjusted to the radical new development.

CONSOLIDATING, CONCENTRATING, AND ECONOMIZING IN MANUFACTURING

In order to reduce costs and to integrate their manufacturing activities with other phases of their business, Standard Oil executives pursued several courses of action simultaneously during the years 1882-1885. The laying of trunk pipelines to Pittsburgh, Parkersburg, Buffalo, Cleveland, Philadelphia, Baltimore, Bayonne, and New York not only was dictated by the existence of refining centers in those cities but also signalized the decision to expand strategically located plants. The question in the Oil Regions was just how many and which of the still numerous plants

should be retained and developed. In connection with the concentration upon a few refining centers, Standard Oil men drove to reduce costs through large-scale operations and improvement in the efficiency of auxiliary enterprises. To use the words of Archbold, the previously instituted efforts toward "consolidating, concentrating, and economizing" continued to be vigorously prosecuted,[26] largely according to plans of four committees—Manufacturing, Cooperage, Case and Can, and Lubricating Oil.

The committeemen built upon the established technology of the industry—the principle of selective distillation in batch stills. The most widely used crude stills for primary distillation were the cylindrical, horizontal type, six hundred to one thousand barrels in capacity, encased in brickwork halfway up the sides, and grouped in batteries of five to ten.[27] Each still was topped by a dome from which a wrought-iron gooseneck vapor line ran to a condenser box containing pipes cooled by running water. Although Standard Oil executives in the 1880's favored horizontal cylindrical stills in new construction, some of their plants used the circular cheesebox type, ranging in capacity from 1,000 to 3,500 barrels. The most common of these were thirty feet in diameter, nine feet in height, and set on a series of brick arches. From both types of stills distillates flowed from the condensers to receiving houses where glass-covered "look boxes" permitted stillmen to watch the color and to test the specific gravity of the liquid distilling over. In the primary operation stillmen normally made just three divisions or cuts—naphtha ranging from 100° gravity, according to the Baumé scale,[28] down to 62° or slightly lower, kerosene ranging from 62° to 36° Baumé, and tar or residuum.

As a means of maximizing the kerosene distillate, stillmen utilized the "cracking" process patented by Luther Atwood.[29] First applied commercially by Samuel Downer in his coal oil works at Boston and Portland, it had spread throughout the petroleum industry. At a time determined by the stillman, when the specific gravity of the distillate at the "look boxes" approached 36° Baumé and was dark in color, the fires were lowered. This action slowed the rate of distillation, thereby holding the heavy fractions in the still at a relatively high temperature for a relatively long period of time. Under these circumstances the molecules were broken up and assumed new arrangements. When the fires under the stills were gradually stepped up, the usual distillation process continued. By this means the kerosene yield from Pennsylvania-grade petroleum was raised from the normal 50-54 per cent of throughput by ordinary

fractional distillation to 75-80 per cent. This process for increasing the yield of kerosene is not to be confused with the methods later devised by Dr. W. M. Burton and others for manufacturing cracked gasoline under pressure of several atmospheres from a special "clean-cracking" distillate.

After the primary distillation, both kerosene and naphtha distillates went through further fractionation and treating. They were rerun in steam stills which were usually cylindrical and horizontal with one rounded end. Heated by steam passing through coils running along the bottom and top, these stills ranged in size from one to two thousand barrels in capacity. Cuts made by the major Standard Oil naphtha processing plants in 1883 are shown in Table 9. A similar range of products was made for kerosene. Both naphtha and kerosene cuts next went into agitators—lead-lined vertical cylinders holding one to two thousand barrels. In these the various cuts were subjected to treatment by a sulphuric acid solution, which joined with the tarry substances remaining in the distillate. A blast of air introduced from the bottom of the cylinder assured thorough mixing. After the air blast had been stopped and the settled sludge drawn off, the remaining liquid was usually treated with caustic soda solution to neutralize any residual acid. Subsequent to the withdrawal of the soda solution the oil was washed with water sprayed in at the top and allowed to percolate through to the bottom. At this stage naphtha cuts were ready for market, the impurities having been removed, color improved, and the products deodorized according to market requirements. Kerosene treating required an additional step. The oil was run by gravity or pumping through the agitators to broad shallow tanks, known as settling pans, where remaining impurities and water sank to the bottom. Within a short time the oil was bright, clear, clean, deodorized, and ready for storing or packaging for delivery to the market.

During the early 1880's and later, the third cut in the primary distillation went through a variety of processes in the course of being converted to lubricants and wax. The procedure at Bayonne was more or less typical. Having been allowed to settle for twenty-four hours, the tar distillate was charged into tar stills of 150- to 250-barrel capacity at the Paraffin Works. The cuts sometimes totaled four—crude equivalent, paraffin distillate, wax tailings, and coke; in other cases the first division was made into crude equivalent and gas oil. After treatment with sulphuric acid and caustic soda in agitators, the paraffin distillate was

Table 9 DIVISION OF TOP FRACTION BY SIX STANDARD OIL PLANTS IN 1883

	GRAVITY BAUMÉ	PERCENTAGE BY PLANTS: *Pratt*	*Doane*	*Maverick*	*Belmont*	*Baltimore*	*Empire, Ltd.*
Gasoline[a]	91 to 100				.26		
	90	1.24	.29	.67	.62		2.12
	88	2.62	.52	.80	6.34		3.02
	87		2.17				
	86		6.29	.17	4.47		7.78
	80	6.53					
Total		10.39	9.27	1.64	11.69	11.74	12.92
Naphtha[a]	76	5.54			18.40		8.94
	75			18.36	20.17		
	74		53.61	13.50			.59
	71			20.24			
	70	57.64	3.15	11.15			24.93
	68		1.94				
Total		63.18	58.70	63.25	38.57	22.95	34.46
Benzine[a]	65			.63	16.29		
	63		5.34		11.18		
	62	9.43	11.39	11.49	7.23		34.44
Total		9.43	16.73	12.12	34.70	52.66	34.44
Bottoms		12.49	7.04	14.56	9.74	6.30	1.96
Burned			3.97				
Loss		4.51	4.29	8.43	5.30	6.35	16.22
Total		100.00	100.00	100.00	100.00	100.00	100.00

[a] Gasoline, 80° and above; naphtha, 68° to 79°; benzine, below 68°.
Source: SONJ, Manufacturing Book B, prepared for H. H. Rogers, the chairman of the Manufacturing Committee, from monthly statements by H. C. Folger, Jr., clerk.

allowed to settle for twenty-four hours, then chilled in ammonia expansion chilling boxes and pressed in knuckle or rack presses powered by steam engines. The products of this process were known as slack wax and pressed distillate. The slack wax was next melted by steam, hardened into cakes in galvanized pans, and then repressed to 121° melting-point scale wax in a hydraulic rack press also known as a hot or hard press. The scale wax was pounded into barrels for sale in the market or for transfer to the Queens County Works, where it was refined and divided

into waxes of varying melting points. The oil from the pressing processes went to reducing stills, which made three cuts at Bayonne—885 oil, 910 oil, and Solar Red. These were treated with acid, caustic soda, and water, then pumped to pans for air blowing and exposure to the sun through the glass roof of the bleacher house to free them from cloudiness. They were then ready for use as lubricants in this form or after mixing with other basic oils.[30]

Lubricating oil works, such as the Eagle plant at Communipaw, owned by the Trust's Eagle Oil Company from 1883 to 1892, manufactured a wider range of lubricants than a general refinery like Bayonne. The naphtha and kerosene fractions of crude oil were regarded as by-products, the objective being to maximize the residuum appropriate to the manufacture of lubricating oils. In 1885 the annual yield statement of the Eagle Works showed these percentage figures: 57.11 kerosene, 7.90 naphtha, 0.82 tar, 2.08 wax, 28.62 lubricating oils, and 3.47 loss, which may be compared with Bayonne data for the same year—77.41 kerosene, 7.37 naphtha, 7.54 tar, and 7.68 loss.[31] In a lubricating oil works, after the two top cuts were removed, without cracking, the residuum was subjected to further distillation to break it up into different oils, which were then purified and refined. Some were then mixed with either the three basic pressed oils, or natural oils, or animal or vegetable oils, to produce lubricants for almost any type of machine. In a few plants some of the products of the tar distilling process were converted into greases of various kinds, the most famous in the days of the horse and buggy being Standard Oil's Mica Axle Grease and Diamond Axle Grease. Some of the viscous residuum became the raw material for the vaseline of the Chesebrough Manufacturing Company, Consolidated.

Although Standard Oil manufacturers utilized established techniques and technology in the early eighties, they relied heavily on patent rights to attain an advantage over competitors in cost and quality of products. At the time of the organization of the Standard Oil Trust, various companies in the combination held at least twenty patents for processes and apparatus in general refining alone. Owned patents dealing with manufacturing lubricants numbered twenty-eight. In addition, Pennsylvania Standard and other companies in the group manufactured deodorized lubricants under a patent taken out by Joshua Merrill. Patents for the mechanical fabrication and filling of cans were practically monopolized by Standard Oil companies; in the New York area the ownership was so diffuse among Standard Oil units that twenty-two patents, seven of which

had been originally issued to Herman Miller of the Devoe Manufacturing Company, were vested in the Combined Patents Can Company. Of the fifty-two patents held by The Atlantic Refining Company, forty-eight were for making cases and cans, almost all of which were the inventions of George H. Perkins of the Le Comte & Perkins Manufacturing Company. New York Standard was assignee of G. H. Hopper and Mark L. Deering, inventors of apparatus for gluing barrels, hoop-driving machines, and barrel-trussing machines.[32] Just to test and disseminate patented ideas and techniques among Standard Oil plants alone obviously required considerable exertion on the part of committeemen.

While favored by many circumstances, Standard Oil manufacturers encountered many obstacles in the path to reduced costs and standardized products. The economies of pipeline transportation indicated that crude oil should be carried to refineries located as near as possible to markets for finished products, but that advantage had to be weighed against losses entailed in the scrapping of existing refining units and in relation to the desirability of expanding plants situated on water routes in order to keep transportation costs on products low. The imperative obligation to supply consumers in a fluctuating market forced committeemen to leave a few refineries as stand-bys while some plants were being dismantled and others were being expanded. The inheritance of a hodgepodge of plants and equipment representing a large investment necessitated modification of existing facilities rather than the erection of the most efficient large units. Convictions of top executives, superintendents of plants, and minority interests often served to slow adoption of changes intended to eliminate waste, reduce costs, improve efficiency, enhance the quality of old products, and create new ones. The situation as a whole dictated that committeemen should devote assiduous attention to detail and should pursue a policy of piecemeal change—a step-by-step movement toward mass production.

Records of the Cooperage Committee reveal the methods and many decisions of that body for the years 1882-1885. It recommended the installation of hoop-driving machines at different plants, the standardization of the scale of interdepartmental charges for steam used in the various cooperage establishments, the procedures to be adopted in gluing and preparing both new and secondhand barrels, the weight of rivets to be put on hoops, the provision of dry storage for secondhand barrels, and the nailing of split barrelheads. One after another, almost all barreling departments were placed under the supervision of George H. Hopper.

Among other activities, his department made periodic investigations of the types of glue used by the various cooperage and barrel-repairing units, tested the effectiveness of wetting barrels immediately after storage on ships as means of preventing leakage, checked the desirability of double-gluing all barrels used for export oils, and determined the best instrument for gauging the tensile strength and ductility of barrel hoops.[33]

In 1885 the Cooperage Committee supervised the construction of a new building for the preparation and storage of barrels and crude oil at Constable Hook and initiated the erection at Bayonne of a glue works. The new plant was to make all the glue needed by Jersey Standard and was to be built so as to permit an expansion sufficient to supply all the Standard Oil needs in the New York area. Within a few months Jersey Standard was also advised to spend a thousand dollars for an experimental plant to manufacture gelatin glue from small hides.[34]

Marked reduction in costs had been achieved in barrel manufacture by 1886. In that year the Bayonne factory was capable of fabricating from ten to twelve thousand new barrels daily. Almost every phase of making barrels was mechanized—assembling, steaming, trussing, reaming, and driving hoops. Hopper's new steam hoop-driving machine enabled one man and two boys to accomplish as much daily as previously had been done by ten men. Barrels that cost $2.35 each to make in 1872 were manufactured for $1.25 each in the mid-eighties. Oil flowed into the barrels by gravity and was controlled by the Watson patent faucet.[35]

Prior to 1884 Standard Oil establishments apparently had purchased shooks for cases from outsiders, but in that year the Case and Can committeemen arranged for the fabrication of all the required boxes inside the combination. They organized the wholly owned Oswego Manufacturing Company, which first leased, then purchased, the box factory of Herrick & Emerick at Fulton, New York. This plant was later used as a stand-by in case of fire after the much larger plant at Oswego was constructed to fabricate shooks from Canadian pine, cut and dried at the expense and direction of Standard Oil. Long advocated by Paul Babcock, Jr., who also won approval for the idea of using knotty instead of first-grade timber in shooks, the auxiliary manufacture of boxes soon proved more profitable than even he had expected. On the basis of operations during the first six months of 1885, Babcock estimated the unit cost at eleven cents per box, or a saving of three cents each on fifteen million shooks per annum.[36]

The preparation of cans for market, a process which had been in-

creasingly mechanized since the early 1870's, received continuous attention in the eighties. In June, 1885, for example, A. J. Pouch reported to John D. Rockefeller that the Case and Can Committee was seeking to examine the machinery of an inventor in Philadelphia and was soon going to Chicago to look at a process, already in operation, which promised "to beat anything now in existence."[37] At about this time the Devoe Works on Long Island, utilizing mechanization and continuous belts in connection with cutting, assembling, and filling operations, were turning out sixty thousand cans and thirty thousand cases per day on an average. Manual laborers soldered on the handles and transferred the cans to the shooks, but automatic machines each nailed up 5,500 to 6,000 completed cases per day. By this process, cans costing thirty cents each in 1874 were being manufactured by Devoe in the mid-eighties for less than fifteen.[38] Lower costs of raw materials may have contributed to that 50 per cent decline, but mechanization and the assembly line technique undoubtedly played a part in the saving.

Since Standard Oil men exhibited an almost infinite capacity for detailed improvement of all auxiliary operations for which there are available data, it is more than probable that they followed the same course in the manufacture of engines, pumps, wicks, staves, paints, tank cars, and tank wagons, not to mention printing and lithographing, all of which were carried on within the combination. Appropriation records of The Bergenport Chemical Works at Bayonne reveal almost continuous changes to improve efficiency and reduce costs in manufacturing sulphuric acid. All the more pleasing to Standard Oil managers, accounts of all auxiliary operations, except printing and wick fabrication, showed satisfactory earnings year after year.

Numerous anecdotes, reminiscences, and demonstrable facts indicate that Standard Oil men from the president of the Trust to still foremen sought assiduously to work out the most economical methods of refining. Minimizing the cost of fuel under stills and boilers affords a case in point. Each refinery burned the fuel which could be delivered most cheaply at the moment: Eastern plants used hard coal most; the Western preferred either soft coal or culm, an inexpensive powdered variety previously regarded as waste by bituminous producers; by 1885 Oil City and Olean plants had found natural gas even more economical than coal. Bulk purchasing kept the price of coal low: Ohio Standard contracted for delivery of 100,000 tons at two dollars per ton during 1885. When market demand for some products fell off, the refiners also

burned tank cleanings or still coke, naphtha bottoms, and wax tailings under stills and boilers.[39]

Ohio Standard set the pace for the combination in maximizing the volume of naphtha products available for market. Prodded by rapidly rising sales to users of stoves and lamps and manufacturers of artificial gas, by 1883 the Doane Works at Cleveland had perfected a method for converting naphtha "bottoms," otherwise known as "ends" or "slops," into marketable products, chiefly benzine of 62° to 65° Baumé. Within less than two years Ohio Standard had also developed a simple mechanism —a dephlegmator consisting of a cold metallic diaphragm across the vapor line—for facilitating the condensation of the top naphtha fractions, particularly those of 86° to 90° Baumé. Officials of the Ohio Company only reluctantly acquiesced to the insistence of the Executive Committee that the new device should be "confided to others" in the combination. Other methods for increasing output and reducing costs in the Trust included the expansion of several plants, the use of a naphtha-processing patent held by H. H. Rogers, and the more careful conservation of products by improved tanks above and below ground. Nevertheless, at the end of 1885 Standard Oil manufacturers were in short supply of 74° naphtha, or stove gasoline, the largest selling item in the top range of fractions. To meet the demand and to reduce competition, units in the combination acquired supplies from outside processors and purchased several small plants.[40]

Standard Oil manufacturers experienced serious difficulties in maintaining a satisfactory quality of lubricating oils in the early eighties. Ohio Standard's failure in the late seventies to meet consumers' specifications as to quality of lubricants had contributed to the decision of one executive to resign from the company. In foreign markets both Russian and Scotch shale-oil lubricants had lower cold tests and proved more satisfactory to some discriminating buyers than Standard Oil pressed-paraffin products. Referring to American conditions, F. H. Bedford, a leading figure in marketing Standard Oil lubricants, later stated his belief that until the late 1880's "there was not a sausage on the market that contained as much mystery as a barrel of lubricating oil in the minds of buyers. . . . customers bought the story rather than the oil."[41] Of course, Bedford was looking back from a more scientific age. And his firm, Thompson & Bedford Company, Limited, operated under the disadvantage of selling refiners' oil on commission only to wholesalers, a

situation which prevented it from receiving suggestions directly from users of pressed-paraffin oils.

Standard Oil executives sought in several ways to solve the problem of supplying consumers with appropriate lubricating oils. The Galena Oil Works, Limited, guaranteed that its oils would give better service at less total cost to the user than those of competitors, and the firm supplied not only products but advice as to their use. The Vacuum Oil Company began sending experts to railroads and factories to make sure that buyers got the exact oil needed. Marketers of these two companies sold directly to consumers and could insist that manufacturers of the products should meet the specifications.

Since the primary obstacle to success for Thompson & Bedford in maintaining control of quality of pressed lubricants lay in the absence of standardized practical tests, in 1882 the Manufacturing Committee engaged the services of Professor F. W. Arvine. This chemist and developer of testing apparatus for lubricating oils took charge of a large laboratory, "fitted up at unlimited expense" on one floor at 128 Pearl Street, New York City. Arvine improved viscosity and cold tests for the guidance of Standard Oil manufacturers but soon decided that, "to learn anything of the real value of the lubricant," he must try engine oil on an engine, spindle oil on a spindle, and wagon grease on a wagon, "all as nearly as possible under the ordinary conditions" of operation. With that aim in mind, he soon had a "power and machinery room" where he could subject different lubricating oils to practical tests on railway bearings, cotton-mill equipment, and the like.

A few favorable results soon flowed from Arvine's experimentation and the condition of the market. By January, 1884, Thompson & Bedford could advertise that its suppliers had made a black winter oil of lower cold test and better lubricating qualities than ever before produced in the United States. Twenty-two months later samples of a new oil—Bayonne Engine—were being sent out to the trade as an improved substitute for Eldorado Engine Oil. Even earlier E. T. Bedford had expressed to Rockefeller his "grateful appreciation" of the help received from Standard Oil manufacturers, especially the Queens County and Bayonne works, in improving the quality of paraffin oils. The "general improvement of our oils," wrote Bedford, "coupled with the general depression of the manufacturing interest all over the world, has afforded us opportunity of making great strides in securing a more general introduction and use of our products as against competing animal and vegetable products." In spite

of his pleasure at the favorable results, he saw further room for improvement, particularly in heavier oils and in developing oils for new uses—rope oils, wool oils, currier's oils, and the like.[42]

With reference to kerosene, the problem was to manufacture enough oil of Water White color to satisfy the trade. Standard Oil marketers tended to push sales of Water White brands because the margin of profit ran slightly higher than on the darker Standard White or Prime White varieties. As a consequence, demand for Water White grew relatively more rapidly than that for other types, a development to which Standard Oil manufacturers experienced difficulty in adjusting. Double trouble appeared in February, 1883, in the form of fire and flood at the Cleveland Refinery, which produced a major portion of the kerosene sold in the Midwestern and Southern markets. Unaccustomed to making large amounts of Water White, Eastern and Appalachian refiners failed to satisfy consumers' standards of quality. When complaints poured in from the West and sales of kerosene declined, Standard Oil men adopted a primitive dephlegmator on crude stills, tried mixing different grades, and reran in steam stills a larger proportion of distillate than in earlier years. The latter method appears to have been chiefly responsible for increasing the yield of Water White illuminating oil by Standard Oil refineries.[43]

As a matter of fact, in assuring uniformity of products all oilmen labored under the difficulty of meeting diverse tests by a variety of prescribed instruments. Although the Supreme Court of the United States in 1877 had decided that the regulation of the tests for illuminating oil rested within the police powers of the states where the product was sold, by 1881 seventeen of the thirty-eight states had yet taken no action. In such states no restriction existed beyond that provided in a federal statute of 1867 prescribing a fire test of 110° Fahrenheit. Other states required fire tests ranging from 110° to 150° and specified various instruments for making the inspections. The mélange of tests and instruments in the United States was more than matched by the requirements of nations, provinces, and municipalities in foreign lands, though many areas accepted the English 73° Fahrenheit flash test according to the closed cup device patented by Sir Frederick Abel in 1879. One commentator on kerosene in 1884 doubted if the legislative regulations of any other substance presented "such anomalous and contradictory characteristics."[44]

All the refineries sought to meet this confused situation by establishing inspection laboratories to assure the delivery of appropriate oils to the various markets, but Standard Oil went one step further. By 1883 the

Manufacturing Committee had engaged George M. Saybolt as chief inspector for the Trust. He was formerly of the firm of inspectors, Lockwood Brothers & Holly, and an inventor of an electric tester.[45] Saybolt began to standardize inspection methods throughout the combination with the intention of holding refiners to uniform qualities of all petroleum products. In addition, he used his facilities at 26 Broadway to test the crude oil and derivatives of competitors all over the world.

As indicated in Table 10, the process of consolidating and concentrating proceeded simultaneously with all other phases of the battle to reduce costs and to maintain quality of Standard Oil products. Dismantling of plants occurred gradually in every area. New Yorkers closed and tore down several plants, much of the equipment from which served to expand neighboring refineries, but consolidation of several units into one or two took place more effectively in Philadelphia and Pittsburgh. Complete elimination of Standard Oil refineries was carried out in several towns of the Oil Regions, some of which are not shown in Table 10. Standard Oil men scrapped the plant of the Union Refining Company at Oil City, the property of Taylor and Satterfield acquired late in 1882 during the course of the campaign against Tide-Water Pipe.[46] By 1886 Standard Oil refining in or near the Oil Regions was confined to relatively few well-equipped plants in Pittsburgh, Franklin, Oil City, Titusville, Olean, and Buffalo.

The last-named city emerged as an important Standard Oil refining center for the first time during the years 1882-1885. The combination's 45 per cent participation in the extremely small plant of Lootz, Holmes & Adams was followed by complete ownership of the Atlas Refining Company refinery in 1882. By this action Rockefeller and his associates assured full utilization of the Buffalo & Rock City pipeline purchased earlier in the same year, sought to exploit the advantages of Buffalo (proximity to crude oil supplies and location on Lake Erie, the Erie Canal, and good railroads), eliminated local competition by a group of active oilmen (R. H. Lee, Daniel Shurmer, John Teagle, Samuel Andrews, and others), and interrupted construction of Lee's projected plant at Titusville. Within another three years Atlas men had enlarged their facilities by constructing some new plants, by adding old equipment acquired through the purchase of three neighboring competing refineries, and by buying an acid-manufacturing plant.[47]

Though Standard Oil "Western" refining centers—those not on the Atlantic Coast—outnumbered those in the East, the preponderance of

capacity had swung to the seaboard by the end of 1885. Plants catering to the foreign and coastal markets possessed marked advantages as soon as the trunk pipelines reached tidewater. In July, 1884, F. Q. Barstow, secretary of the Manufacturing Committee, estimated the still-charging capacity of the combination in the New York–New Jersey area alone at 122,000 barrels, or about 42 per cent of the total 285,000 barrels for the entire organization. Philadelphia with 38,000 barrels ranked a poor second among Eastern refining centers. Baltimore was an also-ran, and Boston and Portland processed negligible quantities of petroleum products. In terms of actual throughput, seaboard plants handled about two-thirds of the crude oil used by the Trust in 1885.[48]

In 1885 the New York harbor nexus of Standard Oil plants for handling, processing, storing, and packaging petroleum and its derivatives presented as impressive a picture as its leadership in still capacity. Grouped in the area were ten refineries (including the plant of the Central Refining Company, Limited, the only firm purchased near New York during the years 1882-1885) and a lubricating oil works (Eagle), not to mention two pressing and paraffin plants (Queens County and Bayonne) and several specialty units. Devoe's case and can establishment, Bergenport Chemical's acid-manufacturing plant, Hopper's paint mills and various barrel-preparing houses, and a barrel factory at Bayonne constituted a strong group of auxiliary operations. New York Standard's Lighterage Department, managed by R. C. Veit, transported all types of petroleum products between the oil yards and storage facilities at Hunter's Point and Empire Yard on Long Island, Sixty-fifth Street on Manhattan Island, the Weehawken docks, and the National Storage Company at Communipaw.

A major factor in the leading position of the New York Harbor area in Standard Oil operations was the expansion of Jersey Standard's Bayonne plant. Between 1881 and 1886 twenty crude stills were added to the original twelve and three steam stills to the first seven. Throughput rose from 1,893,287 forty-two-gallon barrels in 1882 to 2,291,472 a year later, which gave Bayonne first place among all Standard Oil plants for that one year in this period. The volume run then declined to 2,228,745 barrels in 1884 and to 2,141,323 in 1885. In conjunction with the greater throughput and volume of tar distillate after 1882, eight new tar stills were constructed and the paraffin chilling and pressing plant expanded. The Paraffin Works soon surpassed its early 1882 daily average production of thirty fifty-gallon barrels of wax and seventy-five barrels of lubricating oils. The extension of an elevated trestle, installed in 1881

Table 10 LIST OF MAJOR MANUFACTURING PLANTS* OWNED WHOLLY OR IN PART BY THE STANDARD OIL GROUP

JANUARY 2, 1882, AND JANUARY 1, 1886

January 2, 1882		*January 1, 1886*	
Location and Name of Plant	*Owner*	*Location and Name of Plant*	*Owner*
	REFINERIES		
BALTIMORE AREA		BALTIMORE AREA	
Baltimore	Baltimore United Oil Co.	Baltimore	Baltimore United Oil Co.
Canton	Camden Consolidated Oil Co.	Canton	Camden Consolidated Oil Co.
BUFFALO		BUFFALO	
Empire Works	Lootz, Holmes & Adams	Atlas	Atlas Refg. Co.
CLEVELAND		CLEVELAND	
Cleveland	Standard Oil Co. (Ohio), The	Cleveland	Standard Oil Co. (Ohio), The
NEW ENGLAND		NEW ENGLAND	
Boston	Maverick Oil Co.		
Portland	Portland Kerosene Oil Co.	Portland	Portland Kerosene Oil Co.
NEW YORK CITY AREA (New York, Brooklyn, Long Island City, Bayonne)		NEW YORK CITY AREA	
Greenpoint	Acme Oil Co. (New York)		
Vesta	" " " " "		
Washington	" " " " "		
Bush & Denslow	Bush & Denslow Mfg. Co.	Bush & Denslow	Bush & Denslow Mfg. Co.
Empire Ltd.	Empire Refg. Co., Ltd.	Empire Ltd.	Empire Refg. Co., Ltd.
Pratt	Charles Pratt & Co.	Pratt	Pratt Mfg. Co.
New York	" " " "		
Atlantic	" " " "		

Locust Hill	Charles Pratt & Co.	Locust Hill	Standard Oil Co. of New York
Empire Yard	Standard Oil Co. (Ohio), The	Empire Yard	" " " " " "
Long Island	" " " " "	Long Island	" " " " " "
Brooklyn	" " " " "	Brooklyn	" " " " " "
Bayonne	" " " " "	Bayonne	Standard Oil Co. of New Jersey
King's County	Sone & Fleming Mfg. Co., Ltd., The	King's County	Sone & Fleming Mfg. Co., Ltd., The
		Central	Central Refg. Co., Ltd.
OIL REGIONS		OIL REGIONS	
Olean		*Olean*	
Acme	Acme Oil Co. (New York)	Acme	Acme Oil Co. (New York)
Oil City		*Oil City*	
Imperial No. 1	Imperial Refg. Co., Ltd.	Imperial	Imperial Refg. Co., Ltd.
Imperial No. 2	" " " "		
Smith's Ferry			
Watson	Standard Oil Co. (Ohio), The		
Dale	Standard Oil Co. (Pa.)		
Titusville		*Titusville*	
Acme Nos. 3-6	Acme Oil Co. (Pa.)	Acme	Acme Oil Co. (Pa.)
Keystone	Keystone Refining Co.		
PARKERSBURG AREA		PARKERSBURG AREA	
Parkersburg (5 works)	Camden Consolidated Oil Co.	Parkersburg[b]	Camden Consolidated Oil Co.
Warren (Wheeling)	" " " "	Warren	" " " "
James (Marietta)	" " " "		
PHILADELPHIA		PHILADELPHIA	
Atlantic	Atlantic Refining Co., The	Atlantic	Atlantic Refining Co., The
Belmont	" " " "	Belmont	" " " "
Franklin	" " " "		

Table 10 LIST OF MAJOR MANUFACTURING PLANTS* OWNED WHOLLY OR IN PART BY THE STANDARD OIL GROUP

JANUARY 2, 1882, and JANUARY 1, 1886—*Continued*

January 2, 1882		*January 1, 1886*	
Location and Name of Plant	*Owner*	*Location and Name of Plant*	*Owner*
	REFINERIES—*Continued*		
PHILADELPHIA—*Cont.*			
Harkness	Atlantic Refining Co., The		
Philadelphia	" " " "		
Victoria (Elkins)	" " " "		
PITTSBURGH		PITTSBURGH	
Central	Central Refining Co.		
Van Tine	H. C. Van Tine & Co., Ltd.		
Works Nos. 1-7	Standard Oil Co. (Pa.)	Pittsburgh	Standard Oil Co. (Pa.)
Gasoline Works No. 5	" " " "		
Penn Oil	" " " "		
	LUBRICATING OIL WORKS		
CARBONDALE			
Hendrick	Acme Oil Co. (Pa.)		
CLEVELAND		CLEVELAND	
American	American Lubricating Oil Co.	American	American Lubricating Oil Co.
ERIE			
Eclipse No. 2	Eclipse Lubricating Oil Co., Ltd.		
FRANKLIN		FRANKLIN	
Eclipse No. 1	Eclipse Lubricating Oil Co., Ltd.	Eclipse	Eclipse Lubricating Oil Co., Ltd.
Galena	Galena Oil Works, Ltd.	Galena	Galena Oil Works, Ltd.

FREEDOM			
Excelsior	Acme Oil Co. (Pa.)		
NEW YORK AREA		**NEW YORK AREA**	
Wallabout[c]	Jenney & Son		
Eagle	Standard Oil Co. (Ohio), The	Eagle	Eagle Oil Co.
OLEAN		**OLEAN**	
Eclipse No. 3	Eclipse Lubricating Oil Co., Ltd.	Eclipse	Eclipse Lubricating Oil Co., Ltd.
ROCHESTER		**ROCHESTER**	
Vacuum	Vacuum Oil Co.	Vacuum	Vacuum Oil Co.
SMITH'S FERRY			
Paine, Ablett	Paine, Ablett & Co., Ltd.		
	SPECIALTIES		
NEW YORK AREA		**NEW YORK AREA**	
Vaseline Works	Chesebrough Mfg. Co., Cons.	Vaseline Works	Chesebrough Mfg. Co., Cons.
Paraffin Pressing and Candle Works (Queens County)	Charles Pratt & Co.	Paraffin Pressing and Candle Works (Queens County)	Pratt Mfg. Co.
Paraffin Works (Bayonne)	Standard Oil Co. (Ohio), The	Paraffin Works (Bayonne)	Standard Oil Co. of New Jersey
Compounded lubricants (Brooklyn)	Swan & Finch	Compounded lubricants	Swan & Finch
FRANKLIN		**FRANKLIN**	
Compounded valve and signal oils	Signal Oil Works, Ltd.	Compounded valve and signal oils	Signal Oil Works, Ltd.

[a] This list does not include auxiliary manufacturing establishments. The Solar Oil Co. plant at Williamsport, Pa., was inoperative by January, 1882. Other small plants are omitted in that year. In 1886 The Standard Oil Co. (Ohio) also owned in whole or in part the Forest City Naphtha Co., Meriam & Morgan Paraffine Co., L. D. Mix Oil & Naphtha Co., Capital Oil Works, and Dangler Naphtha Refining Co.
[b] Lubricating oil works by 1886.
[c] Leased.
Source: SONJ, Consol. Accts. of S. O. Trust, Dec. 31, 1881, 1885, and Salary Bk. A; W. F. Taylor, "History of the Standard Oil Co," *passim*.

for the mechanical dumping of coal immediately in front of all stills and boilers, helped to reduce labor costs.[49]

One decision during 1885 epitomized the thinking behind the gradual shift of preponderance in Standard Oil refining capacity from beyond the Alleghenies to the Atlantic Coast. Cleveland executives asked permission to expand Ohio Standard's still capacity in order to keep pace with the growing Midwestern demand for Water White kerosene. On the recommendation of the Manufacturing Committee and in "the general interest," top managers refused the request for a variety of reasons. Idle stills of Imperial Refining at Oil City could be repaired more cheaply than new ones could be constructed at Cleveland. Storage for kerosene was available at both Oil City and Olean, and pipage charges were less to Oil City than to Cleveland. The Oil City and Olean plants used natural gas for fuel, which was cheaper than the coal utilized at Cleveland. Projected additional stills at the Eclipse Works in Franklin would soon produce some illuminating oil for distribution by Ohio Standard. At the moment freight rates on finished products from Buffalo, Olean, and Oil City left Cleveland no advantage on that score. Expansion of capacity at Cleveland, it was argued, would result in the manufacture there of additional export kerosene which might necessitate reduction in operation at the seaboard. Cutbacks in refining at coastal refineries would present the "imminent danger" that deliveries through the costly trunk pipelines would have to be curtailed. Finally, said the Manufacturing Committee, "the amount of export oil that can be advantageously shipped from the west seems to be diminishing each year."[50] In the light of all these considerations the Cleveland plant must change but little, but Bayonne could be expanded.

Prior to 1886 Standard Oil manufacturers had attained a substantial measure of success in implementing their desire to operate more efficiently and expansively. While holding Cleveland capacity at a relatively stable figure, they had eliminated marginal and submarginal plants in the Oil Regions, developed a new center at Buffalo, and expanded some strategically located facilities, notably those at Bayonne. Though much more could be done, Rockefeller and his associates had moved slowly toward concentration of refining in a few plants: the Cleveland, Philadelphia, and Bayonne units, which usually ranked in that order in throughput, processed over 39 per cent of the total oil run through all Standard Oil plants in 1885. In spite of a slight decline in operations during the depression year of 1883, throughput by all plants in the com-

bination rose from approximately 15,000,000 barrels of 42 gallons each in 1882 to 17,666,000 three years later. Economies had been effected in new and old auxiliary manufactures and in processing all types of petroleum products. Even if Standard Oil executives did not achieve their aim of introducing all "the most approved methods all the time," as Rockefeller expressed it in 1888,[51] they had at least applied a goodly number of new techniques.

The success of the drive to reduce unit costs by eliminating submarginal plants, expanding those remaining, and effecting economies in every phase of manufacturing showed up clearly in Standard Oil statistics. According to data compiled for the Manufacturing Committee, the average cost of processing a gallon of crude and crude equivalent by all refineries and lubricating oil works in the combination declined more than 15 per cent between 1884 and 1885—from 0.534 of a cent to 0.452, or 0.082 of a cent per gallon. "Costs not embraced in manufacture" and "extraordinary costs" showed a combined drop of 0.742 of a cent per gallon, which with the reduction in the cost of processing made a total decline of 0.824 of a cent per gallon of throughput in costs assigned to manufacturing. Since Standard Oil manufacturers paid 0.191 of a cent more per gallon for raw material consumed in 1885 than in 1884, the cut in total costs of finished products per gallon of throughput amounted only to 0.633 of a cent. Of that amount Standard Oil manufacturers passed on to their customers 0.160 of a cent per gallon, retaining 0.473 of a cent. Consequently, the profit margin of Trust refiners and lubricating oil works per gallon of crude and crude equivalent processed rose from an average of 0.530 of a cent in 1884 to 1.003 in 1885.[52]

More important to the general interest of the combination than economies in manufacture was the fact that Standard Oil plants produced, for the time, a complete range of petroleum products of a quality acceptable, with few exceptions, to legislators, marketers, and consumers everywhere. Refineries of the combination were equipped to manufacture cymogene and rhigolene for use as refrigerants and anesthetics and gasoline for making artificial gas to illuminate homes and factories. Various grades of Standard Oil gasoline, naphtha, and benzine were made for use in vapor and sponge lamps on streets and in homes, for removal of fat from wool, for purifying paraffin wax, for extracting oil from seeds, for manufacturing varnishes, lacquers, oilcloth, and patent leather, for thinning paint, and for cleansing. The same plants turned out illuminating oils ranging from a flash test of 69° and Standard White in color to

mineral sperm oil of 300° fire test for use in lights of signals, locomotives, railroad coaches and cabooses, steamers, and lighthouses. Standard Oil men supplied gas oil for manufacturing artificial gas by the Lowe method, and, in 1885, Atlas Refining was the first in the combination to list industrial fuel oil among its products. Paraffin wax included light, intermediate, heavy, and roofer's grades for sale to makers of candles, chewing gum, matches, bonbons, and other articles. Oils and greases were provided for lubricating every kind of machinery from spindles in textile mills to axles of horse-drawn trolley cars and wagons on the farm. Harness oils had a wide use and Chesebrough's vaseline had become a household word. Some acid sludge went to manufacturers of fertilizers, and residual coke for carbon points to makers of electrical appliances. According to the dictates of the product and the market, products left Standard Oil plants in tank cars, barrels, drums, cans, cases, boxes, buckets, tins, and jars.

ORGANIZING THE DOMESTIC MARKET

In distributing these products during the years 1882-1885, Standard Oil marketers, although successful in terms of growing sales, really made only an unco-ordinated attack upon the problem of organizing the national market for their wares. They struggled with a host of deterrents, surveyed the field, and moved slowly toward the systematization of the domestic market for Standard Oil products. General supervision of "home trade" was exercised by the Executive Committee, busy as it was with other activities of the Trust; until 1886 there was no central advisory committee to formulate policies and to co-ordinate operations in domestic sales except those in lubricating oils. During these years Standard Oil men sold largely, though not exclusively, to wholesaling firms in only a few of which the combination held or acquired an interest prior to 1886. Generally the marketing companies of the Standard Oil organization were eager to reduce competition, to get "closer to the trade" by selling to retailers, and to cut down costs by extending the application of distribution in bulk. But in the four years under review only a start was made in meeting the two last aims, and the first desire posed an ever-recurring problem throughout the period to 1911.

Many general factors favored the marketers of petroleum products in the early 1880's. The rapid growth in population and industrialization, as well as the spread of educational facilities, increased the demand for lighting in the growing number of mills, factories, hotels, office buildings,

and homes. At the same time, construction of railroads and steamships, the mechanization of manufacturing, and the expansion in the number of vehicles called for increasing consumption of lubricants.

Not all elements in the situation were favorable to the marketers, however. In offering a source of light, all manufacturers of kerosene and naphthas had to face competition from electricity, which, although as yet attracting only users in large centers, was gradually to win millions of additional consumers. More important in the eighties was the highly developed artificial gas industry which afforded light for thousands of mills, factories, homes, and city streets. In the race for generation of heat and power, coal was the leader and petroleum the also-ran. Many operators of mills and factories still preferred animal and vegetable oils as lubricants, and particularly steel and tin plate manufacturers adhered to their habit of utilizing tallow for rolling mills.

Fluctuations in general business conditions and prices constituted a continuous problem. Seasonal variations in prices arose from the increased demand for kerosene and naphtha as fuel and illuminating oil during the winter months. The flow of products to foreign ports, determined by the purchases of exporters, was often sufficiently irregular to cause temporary gluts and declines in price. The entire North Atlantic economy experienced a depression in general business during 1883-1884. During the latter year, in the United States a short-lived stock-market panic reflected and accentuated the financial pressure at the low point of volume of business and prices.[53] It was at such a time that the strains of competition were most felt by marketers of petroleum products.

In the marketing of lubricants and specialties practically the gamut of sales outlets was utilized. Although a Lubricating Oil Committee functioned to bring some unity of policy in this area, with Silas H. Paine handling the territory west of the Alleghenies and E. T. Bedford the remainder of the country and all exports, some of the associated lubricating companies operated almost independently of the Trust, notably the Vacuum Oil Company and Galena Oil Works, Limited. Many manufacturing companies sold paraffin and lubricants directly to large consumers, railroads, and makers of roofing. Chesebrough Manufacturing disposed of its products in the United States exclusively through a commission agent—Colgate & Company—but had its own branch offices abroad. On the other hand, the Inland Oil Company sold Standard Oil lubricants, chiefly railroad oils, on its own account in the territories of Chess-Carley, Waters-Pierce, and Consolidated Tank Line. Thompson & Bedford and

Swan & Finch did the same east of the Alleghenies and abroad for pressed-paraffin lubricants. By 1886 the Vacuum Oil Company was selling its products in the South and West to the Standard Oil marketing organizations for ultimate distribution by them but had developed its own branches in Chicago, Rochester, Pittsburgh, Baltimore, New York, Boston, Montreal, and Liverpool. In connection with its branches Vacuum maintained almost as many traveling salesmen as all other marketing companies in the Standard Oil Trust combined. At the other extreme, Charles Miller, probably the greatest salesman in the Trust, personally negotiated almost every contract of the Galena Oil Works and Signal Oil Works with railroad companies. Profits were so large on manufacturing and marketing Standard Oil lubricants that Rockefeller wondered if competitors were "not getting too much encouragement!"[54]

In the early eighties several specific developments demanded that Standard Oil men give closer attention to the domestic marketing scene for kerosene and naphtha. The growth of competition at home and abroad and the tremendous possibilities offered by the rapidly growing Western markets were primary incentives. In 1883 the veteran merchant, Charles Pratt, foreseeing the future growth of competition abroad, stressed the added need for assiduously maintaining and developing domestic sales.[55] The combination could not fail to be interested in obtaining an increased volume of business in the dramatically developing Western areas of the United States, and it was there, too, that competitors were growing rapidly.

Standard Oil marketers reported that "outsiders" were "organizing intelligently," and that some were gaining business by astute marketing techniques. In fact, word reaching New York emphasized successful methods of competitors, including some rather sharp practices—giving longer credit terms than Standard Oil offered, checking on the combination's products and advertising any slight discrepancy in quality, stealing a cipher book, attempting to bribe a billing clerk to get information on the combination's shipments, and the use of hidden companies (apparently to violate quietly a contract with Standard Oil). More usual was the statement that a competitor was underselling Standard Oil or was offering to sell at a stated amount below any price quoted by it.[56]

Perhaps no rival was more closely watched than Scofield, Shurmer & Teagle. This Cleveland firm, which at times had working agreements with Standard Oil and at others was fighting it in court, pushed its products not only in the Middle West but down into Texas. Standard Oil's com-

petition with it was complicated by the fact that the Trust wished to continue to enjoy profits on piping oil to the rival's refineries in Cleveland, that John Teagle, if not "ruthless," as characterized by marketers who lost business to him, was at least one of the most vigorous, imaginative men in the field, and that Frank Rockefeller was married to Scofield's daughter.[57]

Existing relations with wholesalers and jobbing houses provided further reasons for Standard Oil executives to consider changes in domestic marketing policy. Most of the combination's sales were to outside wholesalers in 1882. In a few firms the Trust held an interest, but the relationship was not so close as was desired. Standard Oil men reported that some of their customers were poor administrators, were slow to install new methods of distribution, and were failing to hold their trade in Standard Oil products. Complaints reached New York from a jobber promised exclusive sales in a Western area that his market was being invaded by others selling the combination's products. Some outside speculations of Standard Oil customers and slow payment of debts also occasioned concern.[58]

Two companies in which the Trust held an interest were particularly under suspicion for practices conducive neither to good marketing in the long run nor to the reputation of Standard Oil at any time. Although H. C. Pierce, manager of the Waters-Pierce Oil Company, was characterized by a Standard Oil man as an able marketer, operating expansively and profitably in a "bonanza" district, he was also described as "one of the most unsafe men" working with the Trust. Rockefeller heard rumors that F. D. Carley of the Chess-Carley Company, which had an exclusive contract for sales of Standard Oil products in its area, was "organizing inimical, secret and surreptitious companies" in apparent competition with his own; Carley's object apparently was to depress the market, which would enable him to demand larger rebates from the list prices of his suppliers. Thompson of Ohio Standard recommended that attempts should be made to control and systematize the business of such dynamic men and to introduce a discipline which would prevent some of their practices.[59]

A conflict of interest also existed between refiners and marketers. Demands of marketers for large discounts, which shifted profits from refining companies to wholesaling units, were a cause of intercompany friction most pronounced where the investment of Standard Oil in the marketing outlet was not 100 per cent. Men within the combination complained

that those marketers who were interested in per unit profit rather than volume of sales were not providing as big a market for products of Standard Oil as could be developed. That fact and the criticism that the marketers were not introducing the most economical methods of distribution were among the arguments for direct ownership of marketing outlets "for the protection" of Standard Oil's "manufacturing department."[60] Probably not without weight in discussions, though not mentioned in letters, were the high profits of some of the marketing companies, which made them attractive to the enterprising merchants within Standard Oil.

With these circumstances in mind, executives of Standard Oil repeatedly advocated both acquiring more marketing outlets and maintaining a closer discipline over them. One hundred and thirty bulk stations provided very inadequate coverage of the nation. Rockefeller declared in 1883 that the combination needed more allied marketing firms "competent to exercise discretion" in holding trade. Two years later he expressed the need for top management to be "closer" to the administration of stations selling Standard Oil products and suggested careful inspection of them. F. Q. Barstow wanted to extend the "station system," but only where the move could be made without disturbing relations with good customers. In 1885 W. G. Warden advocated that the system of bulk stations should be extended throughout the country and should be administered by one head in New York. He further suggested that one price should be charged to all,[61] not a widely held idea at the time. In spite of this broad, farsighted suggestion, Standard Oil managers for the most part moved slowly in establishing a national marketing organization and appeared to be meeting particular local situations rather than carrying out a master plan.

As steps toward the more efficient national coverage of wholesaling in the United States, Standard Oil executives organized several new marketing companies. These were formed by adding facilities of former competitors and customers to some of the wide-flung marketing outlets of Ohio Standard. In 1883 the P. C. Hanford Oil Company, capitalized at $500,000, brought into one unit the Chicago plant of the formerly competitive Hanford and Ohio Standard's few stations in Illinois and southern Wisconsin. In the following year the Continental Oil Company was capitalized at $300,000 under an Iowa charter to market Standard Oil's products in the Rocky Mountain region from New Mexico to the Canadian border. Continental included bulk stations of the Continental Oil & Transportation Company and of Ohio Standard. Within six months an-

other Iowa charter authorized the creation of the Standard Oil Company (Iowa), which had a capital of $600,000 and operating headquarters in San Francisco. It took over the business of two firms—Ohio Standard and the Continental Oil & Transportation Company—in Western states (Arizona Territory, Idaho, Nevada, and all the states on the Pacific Coast), Alaska, and the northwest part of Canada.[62] By these organizations Standard Oil brought some customers into the Trust, absorbed some competing marketers, cut off outlets for competing refiners, assured stronger sales units of Standard Oil products in several regions, and increased the influence, if not control, of Standard Oil managers in areas south and west of Chicago.

In all these new marketing corporations, as well as in some organized earlier, the minority interest continued to be strong. In the two Iowa companies Lloyd Tevis, president of Wells, Fargo & Company, held a sizable interest. His representative, Isaac E. Blake, was president of the Continental Oil Company. Men not in the circle of the Standard Oil group held large portions of the Baltimore United Oil Company, the P. C. Hanford Oil Company, the Consolidated Tank Line Company, the Waters-Pierce Oil Company, and the Chess-Carley Company. (See Table 11.) A new agreement with Chess-Carley in 1885 gave Standard Oil a majority voice in the board of directors,[63] but as circumstances developed that voice was not large enough. In point of fact, by 1886 the Executive Committee still had to weigh the wishes of minority interests in all marketing companies operating south of the Ohio River and west of the Mississippi, not to mention those of scores of independent jobbers in the remaining area.

All the marketing organizations were expanded during this period. That development was probably demonstrated best in the affairs of the Consolidated Tank Line Company, whose headquarters were at Cincinnati. It was managed by Alexander McDonald as president and James McDonald, vice-president and treasurer, and later to be one of Standard Oil's leading European marketers. When the firm was incorporated in 1878, its capital was only $60,000 and its area of operations was limited largely to the southern tier of counties in the Old Northwest. By 1886 its stations were to be found from Cincinnati to the Kansas-Colorado line and from southern Dakota Territory to the southern border of Kansas.[64] Its capitalization had been increased by that date to $1,000,000. Similar, though not so spectacular, expansion took place in most of the other marketing units of the Standard Oil Trust.

Table 11 TERRITORIES OF STANDARD OIL MARKETING COMPANIES, JANUARY 1, 1886

Territory	*Company*	*Standard Oil's Percentage*
Eastern New England	Maverick Oil Co.	100.0
	Portland Kerosene Oil Company	100.0
Upstate New York and Northern Vermont	Acme Oil Co. (New York)	100.0
New York City and Long Island, Hudson River Valley, Southern Vermont, Montreal	Standard Oil Co. of New York	100.0
Jersey City	Standard Oil Co. of New Jersey	100.0
Newark, New Jersey	McKirgan Oil Company	100.0
Southern New Jersey, Delaware, Philadelphia area	Atlantic Refining Company, The	100.0
Pennsylvania	Acme Oil Co. (Pennsylvania)	100.0
Maryland, Virginia, North Carolina	Baltimore United Oil Company	83.7
South Carolina, Georgia, Florida, Kentucky, Tennessee, Alabama, Mississippi, Louisiana (east of Mississippi)	Chess-Carley Company	75.0
Southeastern Ohio, West Virginia	Camden Consolidated Oil Company	100.0
Northern Ohio, Michigan, Northern Indiana	Standard Oil Co. (Ohio), The	100.0
Northern Minnesota, Northern Wisconsin, Northern Dakota Territory	Globe Oil Company[a]	
Southeastern Ohio, Southern Indiana, Southern Illinois, Northern Missouri, Iowa, Kansas, Nebraska, Southern Dakota Territory	Consolidated Tank Line Company	60.0
Northern Illinois, Southern Wisconsin	P. C. Hanford Oil Company	51.0
Southern Missouri, Arkansas, Oklahoma Territory, Indian Territory, Western Louisiana, Texas	Waters-Pierce Oil Company	50.0
Territories of New Mexico, Utah, Montana, Wyoming, State of Colorado	Continental Oil Company	62.5
Arizona Territory, Nevada, California, Washington, Oregon, Idaho, Alaska, Northwest Territories of Canada	Standard Oil Co. (Iowa)	60.0

[a] The Globe Oil Company was not purchased until 1887, but it was the chief outlet for Standard Oil products in its area.
Source: SONJ, Consol. Accts. of S. O. Trust, 1881-1887, and Salary Bk. A.

Standard Oil executives made several moves to keep better informed on the marketing situation and to improve the administration of marketing companies. Stations were inspected more carefully; the task was done less thoroughly in the West than in the East, and in the light of later developments appeared superficial. At least as early as 1883, in some areas agents of Standard Oil held regional conferences with their customers. This gave marketers a chance not only to share experiences but also to voice joint complaints to the refinery interests when the quality of oil was not satisfactory. Parenthetically it should be noted that marketers can always sell products better in quality and lower in price than any refiner can produce. On July 1, 1884, a system of reporting on "Home Trade" was introduced and served to keep 26 Broadway informed of current sales of petroleum products.[65] The most significant move was the attempt to encourage the marketing companies to improve methods of distribution by the use of tank wagons.

Distribution in the early 1880's was almost entirely effected by transportation of kerosene and naphtha in tank cars, storage in tanks at strategically located stations, and barreling the oil for final delivery to jobbers or retailers. Several of these steps were under Standard Oil's management, but deliveries to retailers were mainly in the hands of outside middlemen. Tank cars were filled via six-inch pipes at the loading racks of the refineries and were transported to the bulk stations. Those usually consisted of two or more storage tanks, a warehouse, and a barreling plant. Some shipments from refineries went in barrels by rail or water.[66]

Adoption of distribution to retailers in bulk by tank wagons proceeded slowly. Whoever were the pioneers in this method, the Waters-Pierce station at St. Louis and the system of Standard Oil in New York were usually studied by those who early wished to try the innovation. One of its advantages, which will be more fully discussed later, was its appeal to retailers and hence its aid in holding their trade. The method was expensive to introduce, however, and its economies per unit depended on a volume of sales in a comparatively restricted area set by the daily traveling capacity of a horse. The strong advocates of tank-wagon delivery —Pratt, Gregory, Hutchins, Tilford, and others—tried to push the new method in many cities. In Detroit the outside jobber was not willing even to try the innovation; in Chicago the poor roads from the bulk station to the center of the city delayed its introduction. McDonald's experiment with tank wagons in Cincinnati in 1882 proved a failure, but four years

later he had successfully adopted the method.[67] By 1886 comparatively few jobbers were using the new method and Standard Oil itself had but few stations, almost all in large cities, for its introduction.

Standard Oil executives took several other steps, however, to increase the sales of petroleum products. Marketers increasingly distributed heaters, stoves, lamps, lanterns, irons, and other utensils, usually at little or no profit, as a means of expanding the consumption of Standard Oil kerosene and gasoline. The inferior burning quality of kerosene produced from Bradford oil and the inadequacy of existing wicks took the combination into another auxiliary manufacturing operation. In 1883 the Trustees organized the American Wick Manufacturing Company for the purpose of fabricating wicks especially adapted to American kerosene. In a plant leased from the Mount Ida Manufacturing Company at Troy, New York, the new company manufactured wicks in a large variety of shapes and sizes to fit oil-burning devices accurately and sold them to marketing companies below cost.[68]

Participation in two other manufacturing firms was obtained in connection with ensuring outlets for petroleum products. One, the Gilbert & Barker Manufacturing Company of Springfield, Massachusetts, was both a large marketer of gasoline and a fabricator of gas-making machines. In 1865 Charles N. Gilbert, an inventor, formed a partnership with a young machine designer, John F. Barker, to manufacture a safe and efficient apparatus for generating an illuminating gas from high-gravity gasoline. Aided by an able draftsman, Hiram Maxim, later famous as the inventor of silencers and a machine gun, they had some initial success and in 1870 formed the Gilbert & Barker Manufacturing Company, capitalized at $28,000. By that time about six hundred of their gas machines were lighting mills, factories, hotels, and homes with gasoline purchased through them. The company also fabricated metallic barrels and tanks. In 1884, for $83,612 the Pratt Manufacturing Company purchased 306 out of the 400 shares of the Springfield company, whose capitalization had been raised to $40,000. Standard Oil thus acquired one of the largest marketers of gasoline, selling as it did some 75,000 to 100,000 barrels a year, and a versatile manufacturing company for articles associated with the storage and use of petroleum products.[69] Management was left to John F. Barker, C. N. Gilbert, and associates.

An interest was also acquired in a company which bought acid sludge. Beginning in 1882 various units within Standard Oil acquired shares in The Rasin Fertilizer Company, a Maryland corporation which used spent

acid for manufacturing its product. By 1886 the Trust and its affiliates held some 13 per cent of its 7,950 outstanding shares. Standard Oil had already sold the Elizabethport Acid Works in 1883, apparently because it was more economical to sell the sludge than to reclaim the acid. That part which had no commercial value—acid sludge from tar distillation and agitation—was carried out to sea on barges and dumped. In 1885, for example, Jersey Standard's Bayonne Refinery acquired a barge similar to the one already in use for this purpose at the Queens County Works.[70]

Like other marketers, Standard Oil attracted customers by advertisements and the use of known trade-marks. The established brands of the constituent companies were retained and new ones selected. Devoe's High Screw, Pratt's Astral, Radiant, Brilliant, Peerless, Atlantic, Tea Rose, Royal Daylight, Eupion, and others were featured in the advertisements. These appealed to buyers who had become accustomed to their use, even though the products might now be made by different, or several, refineries. Eocene was a popular new moderately priced brand introduced in 1883. In the accounts of companies which both manufactured and marketed products, a few thousand dollars a year appeared for advertising under "Costs not Embraced in Manufacture" or "Extraordinary Costs."[71] More important than the inserts in newspapers and periodicals were the cards printed by units in the Trust for distribution to consumers through local dealers. Jersey Standard had no trade-marks or brands registered in its own name.

Price variations were also used as a competitive measure to get or retain business. Rockefeller always advocated a large volume of business at a narrow margin of profit. When prices declined or trade fell off, Standard Oil reduced its prices. In the depressed year of 1883 Rockefeller first recommended lowering prices "sufficient to hold on to the trade, and as small as possible." The next year he acknowledged that margins must be cut again, as he expressed it, "to secure our *full* share of business." At that time he suggested reducing prices to increase business even to the extent of wiping out all profit, "after paying full pipeage."[72] No such drastic step was taken.

An argument against reducing prices too sharply was voiced by Benjamin Brewster in 1885 when some competitors were complaining at Standard Oil's low quotations. He wrote to Rockefeller:[73]

> My conviction, after a constant canvass of the matter for months past, is that probably a safer and more profitable course for us to pursue in the long run is to make prices at which the outside interests may perhaps keep moving

but not derive sufficient comfort to induce increased construction. I think it is proven by the past that if we make the fight too sharp the result is retaliatory measures and desperate efforts (which every man will make, when fighting for existence) which tend to unsettle and demoralize the business. If we were in a fight, I think no voice would be louder than mine to make it sharp and severe; but now, while we are running so smoothly and have the figures to show that we are holding the business, my judgment is rather in favor of no radical change of policy.

In addition to variations in the open market price, agents in these years had discretion to reduce prices locally. The sparing use of this right was commented on by Hutchins: "Where it is forced upon us [by competitors], we are making a few concessions, in order to get the business."[74]

As early as 1883 Thompson advocated substituting open reductions in price for the system of rebates to customers. "A square fight on open markets" was in his estimation the "cleanest cut way of doing" business.[75] Rebates to customers were a two-edged knife, and competitors were using them too.

Hidden companies, a common practice in the petroleum trade, were also used by Standard Oil marketers. By retaining old names as they took over companies, or bought into them, the managers of the combination concealed its own relationship to them. Often the jobber or wholesaler was already known to be a marketer of Standard Oil products, and when he was bought out he was usually employed by the combination.[76] In part the old name was retained to benefit from the amount paid for good-will and to gain from the reputation of a locally established individual. How hidden the hidden companies actually were is not known, but the implication of critics was that Standard Oil was putting something over on the public. Standard Oil men certainly disliked the use of the practice by competitors.

While Standard Oil marketers were giving attention to methods of increasing their sales, they were also striving to reduce expenses. They considered water against rail transportation at every opportunity. They used coastal steamers and sailing ships. They sent case oil around Cape Horn to California and shipped barreled oil in barges on navigable rivers.

Transportation of finished products by railroads was given careful study, especially by Flagler and others who negotiated with railroad executives. Standard Oil men obtained rebates or reduced rates wherever they could get them. They negotiated contracts with railroads which netted substantial reductions in freights, according to volume of products trans-

ported and distance hauled. On rates from Marietta and Parkersburg to Western points in 1883 Standard Oil gained a discount of 20 to 25 per cent from open rates, but whether anyone paid the open rates is open to doubt; they were merely a point of departure for bargaining, as is the asking price for real estate today. Perhaps no one connected with the Standard Oil interests benefited more from special rates with railroads than F. D. Carley. Until his retirement in 1886 he got especially favorable rebates from Southern railroads by guaranteeing them return freights on turpentine in tank cars to Northern centers. To fulfill these commitments he contracted for most of the turpentine procurable in the South. Owners of a large number of tank cars, Standard Oil companies also enjoyed the advantage of bulk carriage, although they found it difficult on occasion to persuade railroads that the combination should not pay the same rate on carload lots in tanks that was charged for those in barrels.[77]

In fact, bargaining with railroads was a delicate task and the results were not always satisfactory. A railroad, annoyed at losing some shipments, stopped buying Galena Oil from Standard Oil's affiliate. In one case, when Standard Oil threatened to take some business away from a road if "arbitrary" rates were retained, the railroad official countered with the suggestion that he then would give Scofield, Shurmer & Teagle preferred rates. Once bulk stations had been built on a particular line, Standard Oil marketers could not easily transfer their business to another line and their bargaining capacity was curtailed. Standard Oil men feared that at least one railroad, the Baltimore & Ohio, would go into the oil business itself. While some elated Standard Oil letters referred to advantageous rates obtained, or rather smugly to the "rightful difference" being established between rates to themselves and competitors, others complained at favorable rates granted to rivals or to the acceptance of "underhanded" rates by the latter.[78] Probably with an eye to facilitating the statement of legal truth in later testimony, some of the agreements with railroads were oral and cases of their infringement were frequently suspected.

Standard Oil enjoyed advantages in rates, but the favors were neither so easily come by nor so certain as critics implied. Reduced transportation rates were by no means a unitary cause of Standard Oil's marketing success in this period and they were not without their decided disadvantages, as developments after 1885 were to show.

At the same time, the situation with regard to discriminatory rates by railroads on shipments of oil in the early 1880's pointed to the need for

federal regulation. In the very early days of the petroleum business, as in other industries, the relative economic equality of all shippers made for relative equality in the results of the traditional bargaining for rates. By the 1880's, however, the bargaining power of the Standard Oil combination gave it a marked edge over competitors. Economically it was sound practice for railway freight managers to concede lower rates to large shippers, but the inequality in the size and power of shippers resulted in rate differentials which turned out to be socially unfair and hence politically explosive. Since states could not regulate interstate commerce, the federal government necessarily had to assume the responsibility.

Although Standard Oil executives had apparently abandoned in 1881 the wholesale purchasing of refineries, after that date they did make occasional purchases to meet particular competitive marketing situations. The acquisition of the Atlas Refinery in Buffalo and the plant of Central Refining in Brooklyn were cases in point. In 1885, W. P. Thompson, sensing a desire among Cleveland refiners to get "under the shelter of the Standard Oil Co.'s wings," urged marketing friends of Ohio Standard "to take great pains with all outside trade and to treat them as kindly and as well as possible and to consolidate" them in the interest of the combination while the feeling prevailed.[79] Before the end of the year, at least four Cleveland competitors had been taken over and negotiations for contracts with others were in process. Yet numerous overtures from independent refiners were turned down during the years 1882-1885. Many, like George Rice of Marietta, asked too high prices for their properties. Rockefeller and his associates refused to pay. Why buy out a competitor at an "exorbitant" price unless the circumstances of a particular situation favored the action, when the purchase might only encourage other competitors to spring up to seize the business or perhaps merely to try to sell out at a profitable price?

As late as 1885 a few individual Standard Oil executives still had the idea of bringing together all refiners and marketers of petroleum products in the United States, but they had to face the fact that outside refineries kept on growing in number and capacity. In July, 1884, F. Q. Barstow privately estimated that there were ninety-three independent refineries, with a daily capacity of 28,868 barrels, then operating in the country. His calculations showed that Standard Oil plants had about 77 per cent of the total capacity of the nation and that marketers of the combination perhaps sold 80 to 85 per cent of the oil, partly by buying some supplies from the outsiders.[80] Whether reconciled to the fact or not, all Standard Oil top managers had to concede to competitors 15 to 20 per cent of

domestic sales in kerosene, naphtha, and pressed lubricating oils in the mid-eighties.

To provide statistical measurements and a means of administrative control in all marketing operations, Rockefeller and his associates maintained one established technique and adopted one new one. Collecting information on sales by competitors was extended and systematized. Top managers grew indignant when an employee, by showing "want of tact and skill" in gathering data on competitors, brought the company into disrepute;[81] some field men undoubtedly contravened the wishes of 26 Broadway in methods of getting information and in using it. The introduction of the barreling and marketing report by all Standard Oil sales units in 1884 provided a method for checking not only all sales but average costs as well. The day of the unsupervised, free-wheeling marketer was waning.

During the years 1882-1885 Standard Oil executives had consolidated the dominant position of the combination in the American petroleum industry. National Transit men ran gathering lines to almost every well, provided storage facilities for an overwhelming preponderance of the petroleum produced in the country, and completed a system of trunk pipelines to every major refining center of the organization except Rochester. They concentrated the purchase of crude oil supplies in one agency and, by buying at prices prevailing on the oil exchanges, tried to avoid the criticism that Standard Oil set the selling price of crude petroleum. Committeemen and workers alike sought to reduce costs of finished products by developing old and new auxiliary manufactures, by expanding operations in by-products, by seeking new techniques in refining, and by concentrating manufacturing in a few strategically located plants. The expansion of Jersey Standard's Bayonne plant, the first seaboard refinery to receive oil via pipeline direct from the producing area, was a significant aspect of that concentration. Simultaneously, Standard Oil marketers absorbed some customers and competitors, organized new companies, extended and improved techniques of bulk distribution, varied their prices locally and nationally, obtained the best transportation rates possible, and used other devices to maintain dominance in the market. All operations were better integrated and more effectively systematized at the beginning of 1886 than when the Trust was formed. Nevertheless, competition continued, and accomplishing the complete unification of the petroleum industry became less of a possibility when a second major producing area for crude oil was developed after 1885.

Chapter 5

Attack and Counterattack in Foreign Markets 1882–1892

No phase of the operations of the Standard Oil executives during the 1880's demanded more alertness or manifested greater changes in policy than export trade. At the beginning of the decade the Standard Oil group played a passive role in foreign marketing; it disposed of almost all its export oil in the United States to commission merchants or agents of foreign importers. Within a very few years Standard Oil products met sharp competition from refiners of indigenous petroleum in various countries and from the products of Russian crude oil, pushed by the Nobels, Rothschilds, and others upon all the markets of Europe and Asia. The successful application of new techniques in marine transportation became a major factor in the competitive struggle. To meet the threat, Standard Oil marketers, the chief representatives of American oilmen, adopted new and positive measures to dispose of their products abroad, a matter of vital importance to Jersey Standard and other units of the Trust refining in large part for the foreign market.

The methods inaugurated by the executives of Standard Oil to hold and expand the markets for petroleum products from the United States form a significant chapter in the history of the nation's foreign commerce. At the beginning of the 1880's petroleum and its products already ranked fourth in value of exports, exceeded by cotton, breadstuffs, and provisions. Only cotton exceeded petroleum in the percentage of the total national production sent abroad, and petroleum products were the first manufactured American goods, except flour, to reach and retain a significant position in our export trade. As William Herbert Libby, Standard Oil's foreign representative, declared, petroleum had "forced its way into more nooks and corners of civilized and uncivilized countries than any other

product in business history emanating from a single source."[1] Standard Oil's contribution was to defend and enlarge this business.

CHARACTERISTICS OF FOREIGN TRADE IN PETROLEUM

In 1882 the executives of the Standard Oil Trust were keenly aware of the importance of the foreign markets to the profitable fruition of their long-range plans. Although consumption abroad of American lubricants and other products was increasing in the 1880's, kerosene continued to account for more than four-fifths of the value of petroleum exports. Since the 1860's, more than half of that product refined in the United States had been exported.[2] Upon that fact the Standard Oil group predicated its construction of trunk pipelines to, and its concentration of manufacturing on, the Atlantic seaboard. Sales for export were particularly important to Jersey Standard's Bayonne Refinery, which in some years sold for export almost three-fourths of its kerosene.[3]

The fact that the quality of most of the kerosene sold abroad differed considerably from that demanded within the United States increased the importance of maintaining the export trade. Most foreign consumers did not insist, as did many Americans, upon Water White, a clear liquid which not only cost more to distill but was often in short supply during the 1880's. The bulk of export kerosene was the yellowish Standard White. Furthermore, most European nations, upon the advice of their scientists, considered oil meeting a lower flash or fire test as safe as, and under some circumstances safer than, the high-flash or fire-test kerosene required in many American states. To meet the higher flash test of the latter required a greater amount of crude oil per gallon of kerosene. Hence, the sizable foreign demand for Standard White kerosene of 110° fire test enabled American manufacturers to produce large amounts of illuminating oil at relatively low cost and made possible a selling price which appealed to foreign buyers.[4] Anything which threatened foreign markets was of great concern to the American industry, especially to owners of refineries on the East Coast.

The varied characteristics of the national markets for kerosene abroad demanded careful attention. The importation of illuminating oil by a nation generally rose with its population, its degree of industrialization, its improvements in transportation, its re-export trade, its per capita income, and its rate of literacy. In 1882 European countries purchased 67.8 per cent of the value of kerosene exported from the United States. Germany,

the largest customer, took 2,945,900 barrels of 42 gallons; the second ranking market, the United Kingdom and Ireland, bought 1,688,900 barrels. In the same year the next eight customers in order were Belgium, British East Indies (including India), Italy, Austria-Hungary, Scandinavian countries, Dutch East Indies, Netherlands, and Japan.[5]

The destination of petroleum was important in determining the type of packaging as well as the grade of oil. Most petroleum was exported in barrels. For countries where transportation facilities were limited and the climate hot, two five-gallon cans in a wooden case was the most satisfactory method of packaging. The containers withstood heat better than glued barrels, were easy to transport, and they, as well as the contents, had uses for the buyers. Even in the late 1880's about 40 per cent of the kerosene exported went in cans.[6]

Regardless of the final destination, New York was the predominant port for the export of petroleum products. In 1882 it accounted for some 72 per cent of the exports in terms of volume and slightly more in value. Philadelphia followed with 22 per cent in volume, while Baltimore and Boston trailed with 3 and 2 per cent, respectively. All other points together did not contribute quite 1 per cent.[7]

In all ports the mechanism for effecting sales to foreign marketers followed a well-established pattern. Owners of petroleum products sold them to American export merchants or to foreign importers, some of whom had branch offices or special agents in the United States. Standard Oil companies made their sales through these accustomed channels in the early 1880's. The sales were f.o.b., and the responsibility and control of Standard Oil terminated, with but few exceptions, at the water's edge.

All sales contracts for the export trade were subject to the rules laid down by the New York Produce Exchange, even if the shipments left from Boston, Baltimore, or Philadelphia. Although the specific rules differed for crude oil, naphtha, residuum, and kerosene (always referred to as refined oil at that time), the regulations for kerosene serve to indicate the subjects covered and the nature of the control. Refined oil was to be Standard White or better in color, with a burning test of 110° Fahrenheit or more by Saybolt's instrument and with a specific gravity of not less than 45° Baumé. Barrels were to be made out of white oak and cleaned with a lye solution. The hoops, numbering six or eight, were carefully defined as to width and weight. All barrels, not merely those of Standard Oil, were to be painted blue with white bottoms, to be well glued, and to be filled to within one or two inches of the bung. Kerosene was to be sold by weight, at six and a half pounds net per gallon. While

the gross weight was to be measured in whole pounds, the tare was to be marked on the container in half-pounds; the gross weight of a barrel of refined oil was to fall between 360 and 415 pounds. Buyers had the privilege of examining, at their own expense, tare and gross weight and were to be compensated on a whole shipment for marked discrepancies found in a sample.[8]

These were only a few of the regulations which the refiners and packagers of petroleum products for export needed to watch. Practically every municipality, province, and national state in the world passed legislation and introduced regulations affecting the marketing of petroleum products. In exercising their function to maintain the safety of property and people, governments established minima as to quality—color, specific gravity, fire or flash test, and the like. In testing for flash or fire point various instruments were specified—for example, Abel's for the United Kingdom and much of the British Empire, Engler's for the German Empire, and the Pensky-Martin in France.[9] Rules for loading, unloading, and transshipping were usually very definite and restrictive but were the concern of foreign merchants as were the rules governing the location of warehouses and barrel establishments in the specified areas of seaports.

Customs duties were levied by most national states and were frequently altered by legislation or by changes in administration. In Europe, only the United Kingdom, Sweden, Norway, and Belgium admitted petroleum free. Russia and Austria-Hungary had highly protective duties. France and Spain favored their refining industry by means of a differential tariff between crude oil and refined products.[10]

EARLY ORGANIZATION OF STANDARD OIL SALES FOR EXPORT

The burden of guiding and co-ordinating all activities of the Trust relating to foreign marketing rested largely, although not entirely, on two committees—Export Trade and Lubricating Oil. Both made recommendations to the Executive Committee upon price policy and for expenditures, and both conferred with the Manufacturing Committee upon questions concerning quality and price and with the Cooperage and the Case and Can committees upon packaging.[11] The Export Trade Committee, under the dynamic leadership of T. C. Bushnell, exercised more actual control over products within its sphere—crude oil, kerosene, and naphtha—than did the Lubricating Oil Committee, which merely coordinated the foreign activities of companies marketing lubricants and paraffin wax.

Thompson & Bedford Company, Limited, a firm held largely by the Trust, carried the chief responsibility for pushing the sale of pressed paraffin lubricants and wax outside the United States. For a commission of 7½ per cent it acted as the agent for all foreign sales of these products produced by the leading Standard Oil refiners, including Jersey Standard. In 1879, having previously established branch offices in Montreal and Manchester, Thompson & Bedford sent Samuel Comfort abroad to organize the Continental market. Leo Oppenheim, a German with experience as an oil broker in Pennsylvania, accepted the agency at Frankfurt am Main to represent the firm for Northern and Central Europe. James G. Macgowan in Paris sold Standard Oil lubricants in France, Switzerland, and the Mediterranean area, and from 1883 to 1888 Rose, Wilson & Rose, oil brokers, held power of attorney for Thompson & Bedford in London until John Henry Usmar succeeded to the task.[12]

Specialists in particular types of lubricants and ointments maintained their own foreign marketing organizations. Chesebrough listed offices to market vaseline in Montreal, London, Paris, Barcelona, Hamburg, Rio de Janeiro, and Buenos Aires early in the 1880's. By 1885 the Vacuum Oil Company had an office in Montreal, with a manager and four salesmen, while the company's branch in Liverpool, its only transoceanic office at the time, boasted a manager, four clerks, and nineteen traveling salesmen. Under the direction of Edward Prizer, by 1892 additional offices had been established in Toronto, Milan, and Bombay. Foreign sales of Galena and Signal railroad oils were almost entirely the result of the personal negotiation of the famous guaranteed-performance contracts by Charles Miller.

The Export Trade Committee, concerned as it was with kerosene, naphtha, and crude oil, played a key role in the foreign commercial policy of the Standard Oil group. Through its members most of the export oil was marketed to American exporters or to agents in the United States of foreign importers. Interested in friendly relations with brokers, it standardized its commission to them for arranging sales at 1 per cent on all cash transactions regardless of size. Its three members specialized: T. C. Bushnell was responsible for accepting or rejecting specific bids on kerosene in barrels, James McGee those of kerosene in cases, and A. J. Pouch the less voluminous purchases of crude oil, whether in barrels or cases.[13] Decisions for offers on bulk shipments of kerosene and crude oil were added to their responsibilities in 1887. The brief laconic minutes of the almost daily meetings of the committee, extant for 1887 and 1888,

indicate that the committee's members discussed a wide variety of questions. They allocated orders to refiners and decided which brands should be sold for specific regions. They received and transmitted to interested associates reports from a variety of sources upon foreign production, refining, marketing, and other significant factors, such as changes in shipping or foreign exchange. When reports came from Europe and Asia of fraudulent use of Standard Oil's brands, the committee considered what action to take. Its interests ranged over all matters affecting the petroleum business in all parts of the globe.

The key company in sales for export was William Rockefeller's Standard Oil Company of New York. This corporation paid all the expenses of the committees and staffs concerned with foreign trade. Its Foreign Barrel Department, headed by C. F. G. Heye, purchased used barrels in Europe, attended to the routine requirements of loading and shipping, and acted as the channel for payments by buyers of Standard Oil products.[14] Bills of exchange and credit terms for foreign trade were part of New York Standard's daily conversation. All Standard Oil refiners along the seaboard, especially Jersey Standard, continued to be concerned with the volume of sales for foreign markets, but, in the minds of merchants and buyers of Standard Oil products all over the world, William Rockefeller's company was *the* Standard Oil Company.

New York Standard took over Ohio Standard's earlier investment in the partnership of export merchants, Meissner, Ackermann & Company, an enterprise always carried on the consolidated accounts as the "Adventure in the name of T. C. Bushnell." The New York company contributed $50,000 capital and made loans to the exporters from time to time. Livingston Roe, a quiet, unassuming merchant, was the "& Company" representing Standard Oil. The other two partners were Charles F. L. Meissner, resident in Hamburg, and Charles Francis Ackermann in New York. The firm possessed mercantile connections in several parts of Europe and in the Mediterranean. Meissner, Ackermann & Company began about 1879 to consign Standard Oil refined products to Henry Funck & Company in the United Kingdom under an arrangement designated as a "guarantee contract" which was terminated in 1888, when more positive measures, discussed later, were taken to develop sales in the United Kingdom. Meissner, Ackermann & Company also served as the early spearhead for combating Russian kerosene in the Levant and India.[15]

There was, in fact, a measure of truth in a stanza of one anti-Standard "poem":[16]

Alas, for our young refiner bold!
Alas for such as he! !
His oil is sold by a man named Roe
At the price which suits McGee.

The marketing of Standard Oil products in Canada and Mexico was treated for the most part as within the sphere of the Domestic Trade Committee. Sales were made in Boston and New York directly to resident merchants in the Maritime Provinces of Canada. The Ohio Standard and later Minnesota Standard maintained marketing offices at Winnipeg. From 1881 onward the chief outlet in Toronto was a jobber, Samuel Rogers. About 1885, with funds supplied by New York Standard, Joseph Bushnell organized Bushnell & Company, a partnership in Montreal, to operate in conjunction with the agents of Chesebrough Manufacturing and other Standard Oil units in that city. By the end of the same year Waters-Pierce Oil Company had built up an extensive marketing organization in Mexico. The firm, in its own plants at Mexico City and Vera Cruz, had also begun refining imported Pennsylvania crude, on which the duty was lower than on finished products.[17]

Standard Oil had already established in the Spanish West Indies a precedent for exporting crude from the United States and refining it in a protected area. Given the spread between the duties applicable to crude and refined oil, Standard Oil officials decided that greater profits would be made on sales in Spanish territories by refining American crude in Havana. Accordingly, late in 1881, John D. Archbold agreed with Enrique Conill, a merchant in Cuba, that each should contribute $50,000 to build a refinery at La Chorera near Morro Castle. This plant was referred to as the Havana Refinery. In 1882 The West India Oil Refining Company was incorporated in Kentucky to serve as a link between the Trust, which held 50 per cent of its stock, and the partnership in the Spanish West Indies. The business prospered, took over a competing refinery in 1887, and started another plant in Puerto Rico in 1890.[18]

Such operations abroad were the exception in the early 1880's, however. Standard Oil usually sold its kerosene manufactured in the United States f.o.b. to merchants in the ports in the United States, and there its responsibility and control ended.

RISING COMPETITION IN MARKETS ABROAD

Within the rules set by the welter of regulations affecting foreign consumption, the products of the Standard Oil group had to meet a wide

range of competitors. Rivalry was not limited to the conventional boundaries of the petroleum industry. Coal continued as a cheaper generator of heat and energy than petroleum. Vegetable and animal oils were used as illuminants and lubricants by the very large segment of the world's population living in relatively unindustrialized countries. Rape oil was a protected competitor in Germany. Tallow and stearine candles constituted strong rivals to those made from paraffin wax in some markets. In Europe, especially, artificial gas and later electricity gained on kerosene as a source of light for mills, factories, office buildings, and streets. The products of the shale oil industry offered strong competition in some areas. Standard Oil executives closely watched sales for export by rival American refiners of petroleum, but, since the latter accounted for only a small percentage of the business, the chief concern of Standard Oil men centered on the growth of foreign production.

The Standard Oil organization bore the brunt of competition with American oils in foreign trade, since about 90 per cent of the kerosene sold for export in the United States went through its hands. The figures for 1889 show that outside-of-Standard companies manufactured 24 per cent of the total export kerosene, but Tide Water's oil was included in this figure. Not only did Standard Oil market over half of Tide Water's export oils in this period, but other completely independent refiners depended on the combination as part of their market for export illuminating oil.[19]

Standard Oil executives, therefore, had great reason to observe carefully competitors who made products of oil distilled from coal, lignite, and shale in France, Germany, New South Wales, and the United Kingdom. Of these the Scotch shale manufacturers were most significant. Established in 1850 by James Young and his associates, the oil shale industry in Scotland grew rapidly. Consolidations, as well as failures, reduced the ninety firms of 1870 to twenty-six ten years later, while new techniques of manufacturing and able marketing created strong competition for sellers of Standard Oil products.[20]

In 1883 the Manufacturing Committee of the Trust prepared a composite report upon the operations of Scotch shale manufactures, which afforded an insight into the nature of competitive costs and profits. The throughput of shale by the sixteen Scotch manufacturers who published statistics showed an average yield of thirty gallons of crude oil per ton. In spite of the cost of the additional step of extracting crude oil from shale, a loss of as high as 32 per cent in distillation and refining, and a

yield of only 41 per cent of burning oil and spirits, the firms were generally profitable. A good yield of two valuable products, paraffin scale and sulphate of ammonia, contributed to this result. Reports in the following years showed a rising production of shale oil.[21]

Able manufacturing and marketing techniques accounted for the success of the Scotch shale interests. In 1881 George T. Beilby and William Young invented a new retort for use in decomposing shale, which increased the production of fuel gas and doubled the output of sulphate of ammonia just when the falling off of imports of Peruvian guano improved the market for manufactured fertilizers. Three years later the same inventors successfully introduced a method for the continuous distillation of crude oil which was considerably less expensive than distillation in batches. Dr. Norman Henderson, manager of the Broxburn Oil Company, Limited, patented a similar process in 1885 and contributed materially to the manufacture of paraffin wax by his "sweating" process. Scotch shale manufacturers were willing to deliver kerosene in small as well as large quantities, to refund the equivalent of one dollar on each barrel returned, to allow discounts for cash payments, and to extend to purchasers two or three months' credit. It was no accident that, in spite of losing to American kerosene the trade on the Continent, the Scotch shale interests managed to retain a portion of that business in the United Kingdom and to provide wax for approximately two-thirds of the candles made in Great Britain in 1886.[22]

More threatening to foreign consumption of the products of Standard Oil than either sales by American competitors or the Scotch shale interests was the rapid increase of foreign production of petroleum. The American proportion of the world's crude oil output declined from 85 per cent in 1882 to 53 in 1888 and, even including Lima-Indiana crude, which did not enter into foreign trade in this period, climbed back to only 59.5 per cent in 1891.[23] Those figures reflected the development of oil-producing areas in Austria-Hungary, Canada, Japan, and Java, and the emergence of giant producing fields in Russia.

Developments in Austria-Hungary demonstrated the impact upon a single market for Standard Oil products of both an invigorated indigenous industry and of Russian competition. Businessmen in Austrian Galicia had produced and refined petroleum since early in the century and with their improved methods of distillation of the 1850's had developed a well-advanced industry for the time. Thirty years later the industry experienced an accelerated growth. In addition to improvements made in the

Galician industry, a refining center was developed at Fiume. In 1882 more than 571,400 barrels of American kerosene were sold in the Empire. Two years later John D. Rockefeller was reading doleful reports on the drop in the combination's sales of kerosene for that market.[24] By 1891 they were down to about 16,700 barrels, with none at all reported for either 1890 or 1892.

Several factors contributed to the fall in the sales of American petroleum in Austria-Hungary. About 1882 an enterprising Canadian, W. H. McGarvey, by the introduction of the pole system of drilling, speeded up the production of crude oil in Galicia and assumed a dynamic role in all phases of the industry. In addition, both producers of crude oil and refiners were aided by protective tariffs. Given the long overland route from Galicia to the south, the availability through the Adriatic Sea of imported crude oil, and the lower tariff on it than on products, businessmen invested in refineries at Fiume about 1884. Although some American crude oil found a market there, the nearness of Russian suppliers, their adoption in 1886 of steamers fitted with tanks for this trade, the investment of the Rothschilds in both Russian production and refining in Fiume, all encouraged importation of the Russian oil. Americans complained that the administration of the new high tariff of 1887 aided their competitors. Through a literal interpretation of rates by "specific gravity," a "manipulated Russian oil" was allowed in under the crude oil rate. Rich in lubricating oil distillate, and yielding a high ratio of kerosene, it won the market. At the same time, some small Galician refiners contributed to the rout of American kerosene by selling a low-grade product in barrels labeled "Standard Oil Co., Long Island City, Refined Standard Petroleum." Since its brands were not registered in the Austro-Hungarian Empire, Standard Oil had no redress against this unscrupulous practice.[25]

Concern of the American oilmen over the loss of the Austro-Hungarian market during the 1880's was related to, but was much less significant than, their alarm over the phenomenal upward surge of Russian petroleum. Production in the Caucasus rose from 12.7 per cent of the world's crude oil total of 35,704,000 barrels in 1882 to 37.9 per cent of 91,100,000 barrels in 1891. Contemporary observers differed with one another and from time to time in assessing the impact of the Russian industry on the market for American petroleum products, but never did the American oilmen fail to observe carefully the factors affecting their rivals and the growth of their exports. As early as the late 1870's good Russian lubricants were actively competing with American in Western Continental Europe.

By 1883 kerosene from Baku appeared in Austria-Hungary and England for the first time. Within the next twenty-four months it was competing with American illuminating oil in nine countries and two years later in seventeen. In 1882 the American product practically monopolized world exports of illuminating oil. According to Standard Oil's estimates, by 1888 Russian-exported kerosene totaled 3,087,000 barrels and had seized 22 per cent of the world's export market, leaving the United States with 78 per cent.[26]

Many conditions affecting the costs and profits of the petroleum industry in Russia differed from those in the United States and needed to be assessed by Rockefeller and his associates. The characteristics of the crude oil, the costs of producing and refining it, the transportation facilities available, governmental policies, and the nature of the Russian domestic market were all factors affecting the competitive situation.[27]

The policies of the Russian government had a marked though mixed effect on the development of the Russian industry. In 1873 the Czar abandoned his long-time policy of granting a monopoly for the production of crude oil, and, opening the door of opportunity to all who wanted to enter the risky business, speeded up the growth of the industry. The government's fiscal policy had diverse effects. On the one hand, in the 1870's Russia removed the excise tax on the refining of kerosene, raised the tariff on it to prohibitive levels, guaranteed the financing of a railroad from Baku (the producing and refining center) to Batum (the port on the Black Sea), and spent large sums in constructing "commodious" harbor facilities. Opened in 1883, the railroad made possible for the first time sizable exports of petroleum products by water transportation. On the other hand, the imperial government in 1886 handicapped the petroleum industry by abolishing the freedom of the port of Batum. Even though a drawback was allowed on metal in exported cans, other supplies for the petroleum industry had to pay the high Russian tariff. The reimposition of a high excise tax on kerosene in 1888 acted as a deterrent to the development of domestic sales. Since the tax was levied only on illuminating oil consumed in Russia, the policy encouraged its exportation.

Several natural characteristics of the industry favored the Russians. While American production in the late 1880's was dispersed over a fairly wide area in New York, Pennsylvania, West Virginia, and Ohio, the Russian was concentrated in an area of five square kilometers near Baku. More significant was the fact that many of the Russian wells were gushers; the average yield was over 280 barrels per well daily, which may be com-

pared with the 4½ barrels in the United States. Although initial drilling costs were higher in the Caucasus, a much smaller number of wells provided an adequate supply of crude oil, of which 80 per cent was produced by fourteen integrated companies in contrast to the hundreds of small producers in the United States. The famous Professor Mendeleeff, who devoted much scientific attention to the industry, estimated that costs of producing crude oil in Russia were one-third to one-half of those in the United States.

The crude oil differed markedly from American petroleum. Russian petroleum contained little sulphur and no paraffin, and the derived lubricants surpassed their American equivalents in viscosity at low temperatures. While the raw material yielded a relatively low proportion of kerosene and a large per cent of heavy oil, the high price of coal throughout Russia helped to create a market for the relatively inexpensive *astatki* as fuel for steamships, locomotives, and factories. Given the nature of the petroleum and the domestic market for fuel oil, the refiners concentrated less on obtaining a high proportion of kerosene and thereby were enabled successfully to introduce the economies of continuous distillation (discussed later) earlier than in the United States.

The possibilities of the Russian industry attracted foreign capital and an able group of businessmen. Although among the approximately 150 refiners of 1888 there were many small operators, about a third of the kerosene was manufactured by the firm of two brothers of Swedish extraction, Robert and Ludwig Nobel. To the industry they brought family capital, engineering training, business experience, willingness to try new methods, and organizing ability. Starting with a refinery at Baku in 1875, they soon acquired producing property and adapted to Russian conditions American drilling methods and pipeline construction between wells and refineries. The Nobels employed drillers, packagers, refiners, engineers, and scientists from Russia and many foreign countries, including the United States. In 1879 they organized Nobel Brothers Petroleum Industry Company, Limited, which, with modifications in its charter, was empowered to carry on an integrated petroleum business even to ownership of foreign marketing outlets. The brothers Nobel were credited with doing much to develop the market for fuel oil in Russia, initiating the utilization of tank cars on Russian railways, and introducing, with the *Zoroaster* in 1879, the large-scale use of bulk steamers on the Caspian Sea. In the following year, with the aid of new capital, they constructed a refinery on the most advanced scientific principles of the time. It was one

of the first to utilize the continuous distillation process on a commercially successful basis.

By the middle eighties another powerful family had moved into the Russian petroleum business. Under the guidance of Baron Alphonse de Rothschild, the Paris house of the family invested in several companies whose functions ranged from producing and refining to shipping and marketing. The Caspian & Black Sea Company (Société Industrielle et Commerciale de Naphte Caspienne et de la Mer Noire), organized in 1884, soon became, through contracts with small refiners, the largest exporter of Russian kerosene. Facilitated by the Rothschilds' efficient case and can plant in Batum, which employed experienced workers from The Atlantic Refining Company, the products soon gained rapidly in the markets east of Suez. The Rothschilds' investment in marketing outlets in European countries strengthened their competitive position there.

Other enterprising businessmen had an influence on the competition of Russian products with those of Standard Oil. Among these was V. Ragosine, the general manager of the Shibaieff Company. Chemist and engineer, he was the acknowledged leader in the manufacture of high-grade lubricants from Russian crude. By the late 1870's his products were making inroads into the sales of Standard Oil products in Central and Western Europe. In the meantime a Scotch engineer, Thomas Urquhart, by increasing the use of fuel oil on Russian railroads, had an effect on the profits of the petroleum industry. Paul Dvorkovitz, one of Ragosine's associates, pushed the use of fuel oil in Moscow's factories in the middle 1880's, then went to England and persuaded manufacturers to use Russian "solar oil" in making artificial gas.

In spite of the contemporary controversy over the comparative qualities of the American and Russian kerosene, neither enjoyed marked general superiority. There appears to have been very little difference in the burning quality of the best kerosene from either country if used in lamps and with wicks designed for that oil. In the early 1880's when lamps and wicks were designed to burn American kerosene, that oil gave a better light and smoked less, although defenders of the Russian product contended that their kerosene was consumed less rapidly. The performance of Russian illuminating oil was considerably enhanced by the introduction of special lamps and wicks; by 1887 one firm, Kumberg, alone was manufacturing 140 types of such lamps.[28] Most of the shipments from Baku to the English market were of Water White kerosene which met a flash

test of 83° F. on the Abel instrument, while the majority of the American kerosene was Standard White of 73° flash test.

Thus, many factors contributed to making the sellers of Russian oil strong competitors to marketers of Standard Oil products. Cheap crude, inexpensive labor, and continuous distillation kept the manufacturing costs of Russian kerosene low. The disastrous effects of low-paid labor were not yet apparent. With a growing domestic market for fuel oil, the Russian refiners looked upon kerosene almost as a by-product. Since its output increased with the manufacture of fuel oil and there was no wide domestic market for it, the kerosene had to be exported at the price it would bring. While some of the refiners turned out a product which was poor, and which some careless or unscrupulous men were willing to market in old or counterfeit Standard Oil barrels, the large and more efficient refiners turned out a good product which they pushed abroad under their own brands. The very fact that such well-financed firms as the Nobels and Rothschilds were attempting to develop foreign markets in competition both with each other and with outside exporters of Russian kerosene reduced prices to a level which made the products particularly acceptable. In Eastern Europe, the Mediterranean, and Asia the Russians also had the advantage of short transportation routes.

Many contemporary observers commented on the Russian industry. J. C. Chambers, the American Consul in Batum who doubled as observer for Standard Oil, reported fully to America on the industry. He hardly assessed the situation scientifically when he charged the Russian interests with a "quixotic ambition to drive the American oil from the markets of the world," with "a courageous disregard of financial results," and with "working, not for legitimate producing and manufacturing profit, but for the premium upon tank-car capacity, commission merchants, money-lenders, and fame."[29] In his dry-as-dust reports, started in 1884, however, he provided ample factual data for the Americans to see that the future as well as the current development of the Russian industry could not be ignored and that competitors must show initiative and imagination if they were to expand, let alone hold, the foreign markets for their products. W. H. Libby, after visiting Russia and the Near East, wrote to the American Minister to Turkey in 1886: "If the Russian petroleum industry is to be permanently formidable and aggressive, it will, in my judgment, be traceable to the brains, genius, and perseverance of a comparatively small number of men who can command the support of the Russian government

and the confidence of the banking centres of Europe."[30] The policies of these men undoubtedly had an impact on those of Standard Oil executives.

STRIVING TO HOLD FOREIGN MARKETS, 1883-1888

As competition with American petroleum products abroad grew, Rockefeller and his associates were faced with many questions. How could they keep up or increase the consumption of their kerosene? Should they concentrate upon the products of Pennsylvania-grade petroleum or sell for foreign markets some of the kerosene from the growing production of Lima-Indiana crude? Should they acquire producing properties abroad? Should they pursue a policy, already applied in isolated cases, of establishing refineries at strategic foreign points to process American crude or foreign supplies where available? If they concentrated on marketing techniques, how could they best develop foreign sales and meet competitors?

Executives of the Trust at first merely modified and intensified their established methods. They kept informed of competitors' activities, took positive steps to increase the consumption of petroleum products, signed a long-term supply contract for crude oil with a large foreign refiner, lowered prices, carried on their side of a price war with Russian oil in some markets, and in one case worked out an understanding with competitors. Moreover, Standard Oil strove to eliminate complaints about its products and to improve their quality and packaging.[31]

At all times information upon competitors and foreign markets was kept as current as possible. J. C. Chambers cabled detailed data on sailings of kerosene-laden ships from Batum and often wrote special reports analyzing the situation in the Caucasus. Letters and oral accounts from merchants all over the world were received daily. Men at 26 Broadway perused available published materials, including consular reports, American and European trade journals, and similar published data, then analyzed the facts for those concerned with particular functions. As W. G. Warden, on a trip to Europe in 1883, expressed the group's aim to Rockefeller, "We should have all the information that it is possible to get, which can be obtained in a proper way."[32]

During these years several Standard Oil men traveled abroad to make special studies of foreign conditions, to make recommendations to executives in New York, and, in some cases, to take positive measures to promote the sales of kerosene. No agent of Standard Oil journeyed further, saw more prominent people, or had a greater influence than the apparently

indefatigable William Herbert Libby. Formerly of the firm of New York exporters, Libby, Bartlett & Kimball, Libby was a personable and cultivated representative, an experienced merchant of oil, an astute observer of trade conditions, an able judge of men, and a tenacious negotiator. He proved to be a business diplomat of the first rank. After joining Standard Oil in 1878, his first major foreign assignment was to leave four years later for a long stay in the Far East.

Even before the sharp rise in foreign competition, Standard Oil executives had begun to devote attention to the development of the markets east of Suez. The area had a low per capita income and a low consumption of kerosene, but, having a tremendous population, it offered great marketing possibilities. In China the kerosene trade was burdened by competition from native vegetable oils, heavy taxes, irregular deliveries to the interior, and the control of retail trade by conservative merchant guilds. In some cities regulations forbade the sale of kerosene; this ban resulted from the pressure of vendors of peanut oil and the fires caused by the lack of safe, cheap lamps. At the same time that Libby went to the Orient the diplomatic and consular representatives of the United States were under instructions from the Department of State to forward the trade in petroleum products, especially through studying and opposing crippling legislation and ordinances.[33] Standard Oil's representative devoted most of his attention for two years to Japan and Northern China.

Libby's activities in China alone covered a wide range. Besides observing and evaluating all phases of the retail trade, he became acquainted with importers in all the leading ports. In a letter, dated November, 1884, to Sir Robert Hart, the inspector general of China's taxes, Libby urged the adoption of uniform tests, by either the Abel or the Saybolt instrument, for all of China. In a pamphlet translated into Chinese, he wrote of the advantages of kerosene and how to use it safely.[34] No copy of the circular has been found, but an excerpt from one of Libby's letters to the governor general of India preserves his line of argument:[35]

> I may claim for petroleum that it is something of a civilizer, as promoting among the poorest classes of these countries a host of evening occupations, industrial, educational, and recreative, not feasible prior to its introduction; and if it has brought a fair reward to the capital ventured in its development, it has also carried more cheap comfort into more poor homes than almost any discovery of modern times.

As competition increased, Libby's tasks multiplied. About a year after his return from the Orient, he made a trip to Baku and St. Petersburg,

then spent several months evaluating the Russian competition in Turkey and the Balkans. In 1887 he patiently negotiated, after long, tedious months, a six-year contract for the sale of some 500,000 barrels of crude oil per year to one of the leading French refiners, A. & K. Deutsch & Company (later Les Fils de A. Deutsch). In return Standard Oil promised to sell no kerosene for export to France and to operate the French firm's forwarding plant on the Delaware River.[36] Before the end of the year Libby was in India to collect information and to recommend measures for meeting the Russian competition which was practically sweeping American oil out of that sector. On returning to Europe, he spent two years in negotiations with foreign merchants, the results of which are discussed in the last section of this chapter.

In the meantime, on the basis of Libby's reports of 1886, Standard Oil men chose to carry the fight directly to the sellers of Russian kerosene in the Levant, the area of the Russians' greatest advantage outside their own country. The instrument was Meissner, Ackermann & Company. Its agents in Salonica and Constantinople, A. and H. Seefelder, received instructions on selling prices and other activities in Alexandria, Port Said, Beirut, Smyrna, and the Grecian Islands. All shipments were in cases sent c.i.f. When freight rates rose in 1887, the Seefelders were permitted to purchase a limited quantity of Russian oil to meet their orders; and during the years 1887-1888, at least, they participated in a kerosene pool with some competitors in the Turkish market.[37]

All sales of American kerosene through Meissner, Ackermann & Company in the Levant were operated through a pool. Participating in the account, carried on the books of New York Standard from 1887 on, were those companies to which orders for kerosene in cases were assigned, including not only four Standard Oil refiners but three Tide Water units.[38] Each participating company contributed funds to the pool and, when allotted an order below the full scheduled price, was reimbursed from the account for the difference.

The efforts of Meissner, Ackermann & Company were scarcely more than a prick upon the opponents' armor. Instead of decreasing, the flow of Russian oil grew larger. The Nobels sold a growing volume of kerosene through their special agents, and the Rothschilds established affiliated companies in several Western European countries. A mounting quantity of Russian case oil entered markets east of Suez. Consequently, Standard Oil was forced to broaden the so-called area of "Russian competition" to include Bombay, Madras, and Calcutta during 1887-1888.

The reduction in prices for sales through Meissner, Ackermann & Company was only one part of Standard Oil's adjustment of prices to meet competition in the foreign markets. As soon as sellers of American oil abroad had been forced to lower prices in order to compete with Russian kerosene, prices to exporters in the New York markets were reduced, just as similar pressures had pushed prices down in the domestic market during the early 1880's. Following the usual practice, on authority of the Executive Committee, the Export Trade Committee posted schedules of prices on the Produce Exchange. On the well-known Standard Oil brands the Export Trade Committee adhered fairly rigidly to these scheduled prices. Some sales were made through brokers to exporting merchants at slightly lower rates, however, and occasionally on cases containing unlabeled cans the price was cut more drastically.[39]

Whatever the competitors thought of the reduction in prices, the policy brought a series of protests from Standard Oil refiners. Jersey Standard's Paul Babcock concluded one letter of complaint to Rockefeller as follows: "Pardon this letter if to any one it seems uncalled for—but my little all is in the Standard Trust. I have *nothing* to fall back on, if it goes to the wall—*All* my time & thought & effort are given to its interests & I believe we are today *selling too low! ! !* "[40]

Price formulation, a subject of no little complexity, was the topic of almost daily consultation among the various committees. In the month of April, 1888, for example, the Export Trade Committee announced ten changes in the price of barreled kerosene for export. Of those, half were up and half down, and at the end of the month the quotation was one-eighth of a cent per gallon lower than at the beginning. The prices of cased and barreled oil moved together, the former being about two cents per gallon higher than the latter. The cost of packaging always had to be considered, as, for example, in November, 1887, when case oil was advanced one-eighth of a cent per gallon as a result of the "recent advance in materials."[41]

The relationship of prices between various brands with their different specifications was a matter of delicate adjustment. In 1887, Tea Rose, which met the 73° Abel test and was a popular brand in the United Kingdom, was priced at one-eighth of a cent per gallon over 21° Celsius. Royal Daylight, a well-liked kerosene in Europe, was another one-quarter of a cent higher, while Pratt's P. W. 120° kerosene was five-eighths of a cent above Royal Daylight. When an unusual order came from Sweden for 22.5° Celsius, upon the recommendation of the Manufacturing Com-

mittee the sale price was set at one-sixteenth of a cent above the current quotation for 21° Celsius.[42]

As earlier, Standard Oil executives devoted a great deal of attention to the quality of their products and engaged outside experts to investigate all serious complaints and to recommend methods for improvement. F. W. Lockwood of the leading New York firm of oil inspectors, Lockwood Brothers & Holly, went to Europe several times for Standard Oil. In 1884, after letters of criticism from consumers in the United Kingdom and Ireland had reached the company through the London Petroleum Association, Lockwood toured the British Isles with the English petroleum expert, Boverton Redwood, investigating the causes of complaint. Lockwood explained to oil merchants in speeches and in a pamphlet that long storage of oil and the use of low-grade burners and ill-fitting wicks accounted for lack of satisfactory service from oils which had met even the strict tests of both Standard Oil and the New York Produce Exchange.[43]

On the strength of Lockwood's reports, and in order to make certain that American kerosene should give the best possible service to consumers in the United Kingdom, Standard Oil officials arranged for the manufacture of wicks designed to provide the proper drawing power for American kerosene. On January 13, 1885, representatives of New York Standard signed a contract (which Jersey Standard took over in 1899) with the largest maker of wicks in England, Joseph Morgan & Son of Manchester. The latter agreed to manufacture at least ten thousand pounds per week of the "ordinary super Petroleum" or "Paraffine Wick" of all appropriate sizes from three-eighths of an inch to two inches to fit accurately the large variety of plain and ornamental English lamps. The wicks were to be subject to the rigid testing of Boverton Redwood. In the contract the British house committed itself to a limited maximum price, to give discounts, and in other ways to promote sales. In return the Standard Oil Company promised to pay a subsidy dependent upon the price of yarn.[44] By the Morgan contract the executives of Standard Oil had adapted to their British market the technique established earlier in the United States with the creation of the American Wick Manufacturing Company.

At the same time, the Manufacturing Committee and others concerned with the reputation of Standard Oil's products took continued steps to improve the quality of the kerosene and to make certain that it met the specifications of the various brands. Following a report in 1885 that ship-

ments of Tea Rose were not uniform in gravity and flash point, an investigation was made immediately. The defect was traced to "Western" or "outside" kerosenes purchased by R. C. Veit from independent companies in Pennsylvania and Ohio, a practice which gave Standard Oil enough supplies to meet its orders, furnished small refiners with an outlet for their products, and prevented their cutting prices. To obviate further complaints, the Cooperage Committee advised Veit that each day's supply of Tea Rose at Weehawken should be mixed, barreled, and dated, so that a day's delivery to a ship would be uniform. The Manufacturing Committee also laid down more stringent rules for testing all export oil. Two samples were drawn from each filling tank, one after the pumping to it was completed and another twenty-four hours later. Only if the oil had not changed color between the two samplings and had been accepted by two or more authorized inspectors of the Produce Exchange could it be put on a ship. In any case a sample had to be sent to Saybolt's central laboratories for testing. At the same time, Standard Oil refiners improved the method of producing export oil and raised the standard of burning quality for their popular Royal Daylight. This kerosene, unlike some brands manufactured at several refineries, appears only to have been ordered from Bayonne.[45]

Although Standard Oil executives sought to maintain the quality of export oil, they hesitated to support one restriction suggested for the Produce Exchange. When in 1887 competitors began shipping kerosene made from Lima crude, Standard Oil men feared that exporting this product before satisfactory methods had been developed to improve it would hurt the general reputation of American oil abroad. The members of the Export Trade Committee sold none of this product for export, but, looking ahead, they advised against restricting its sale. Not only would such a move operate against their own business later, "in the event of succeeding with this oil," but it would prejudice the development of any other new producing fields. The Executive Committee, however, stood in favor of an amendment to Rule 35 of the Petroleum Code of the New York Produce Exchange to the effect that all Lima oil should be excluded on general contracts for refined oil. A few days later, on a motion from C. F. Ackermann, the members of the Exchange supported this policy,[46] and it was not until 1895 that the improvement of refining caused the decision to be reversed.

Attention given to packaging by the various committees suggests that Standard Oil's success in foreign fields rested in part upon its infinite

capacity for taking pains. As reports came in that cans containing Russian cased oil were defective, Standard Oil men gave even more attention than before to upholding the quality of their own. Every effort was made to send out oil in leak-proof cans. Shipments in Boston hand-made cans were discouraged; these cans not only were more expensive but were not considered so uniformly sound as those manufactured on a mass-production scale on an assembly line. After consideration of the costs involved, Standard Oil officials turned down requests from merchants for fluted cans and for those with crimped sides. Iron drums were used where the trade required them and where customers were willing to pay for the added cost.

To prevent leakage of export oil the Cooperage Committee made detailed studies, encouraged plants to carry out experiments, and made repeated recommendations to affiliated companies. In 1885 it decided that except in unusual circumstances imported used barrels, known as "ship seconds," should not be employed for the export of Water White kerosene or deodorized naphtha. When the committee's studies two years later indicated that the extra cost of three-quarters of a cent per barrel for a second coat of glue was justified by results, the members advised all Standard Oil interests shipping export oil to "double glue" their new barrels. Detailed rules as to the temperature and quality of glue to be used for each season were given; at least three days were recommended as the period between the application of the two coats. The committee advised the use of steel or extra-heavy iron chime hoops weighing twelve pounds per set on all barrels containing naphtha, and, on those for export, nine-pound rivets on chime hoops instead of the usual seven-pound. When the development of bulk marine transportation did away with the necessity for millions of barrels to make a return trip across the Atlantic each year to be repaired and refilled, the members of the Cooperage Committee sent one of their own experts to Europe to teach, as they expressed it, "our methods" of reconditioning "ship seconds."[47]

In spite of all efforts to improve the barrel as a package, as late as 1891 complaints came to New York about the poor condition of those containing paraffin wax. A special committee was then appointed to report on the best packaging for exporting that commodity.[48]

To meet other problems in relation to wax, Thompson & Bedford Company, Limited, entered into an "understanding" with the Mineral Oil Association of Scotland and the Candle Makers' Association of London in 1888. The Scotch shale manufacturers not only offered strong

competition to American wax in the United Kingdom, Ireland, and on the Continent, but in times of depression, such as 1884, they had sent considerable quantities of their product to the United States. When three years later the manufacturers and candlemakers grew concerned at the condition of the market for wax, Edward T. Bedford traveled to Scotland for negotiations which resulted in an agreement governing the volume and price of the commodity. The production of wax was set slightly higher than the estimated consumption in order to allow for some expansion of the business; prices to both candlemakers and retailers were to provide profitable operations for all, even with the "poor man's candle" selling to the consumer at four for a penny. In the carefree days when a negotiator could speak openly of an international agreement, the genial Bedford confided to the press that all participants had made concessions —manufacturers of both Scotch wax and candles to smaller volume and lower prices than they wished and the Standard Oil to higher prices and less volume than desired in view of the competition from stearine candles.[49] Perhaps the Americans were willing to agree to a compromise in return for Dr. Norman Henderson's new and improved method of making wax; it was soon introduced in most Standard Oil refineries.

Whether operating under agreements with British waxmakers or not, Standard Oil marketers steadily expanded the export sales of American paraffin wax. They were the chief sellers, and exports rose from 5,369,821 pounds worth $437,187 in 1881 to 66,366,003 pounds valued at $3,714,649 ten years later.[50] One factor in the growth of sales was undoubtedly a reduction of 30 per cent in the average selling price per pound between 1881 and 1892.

Although Standard Oil did not embark upon any new program of producing and refining abroad during these years, the subject was under consideration from time to time. James Corrigan's refinery in Galicia, in which Standard Oil of Ohio had made an investment in the 1870's, operated until 1885, but it did not appear in the list of petroleum concerns in Austria-Hungary the next year. Shortly thereafter Standard Oil was approached to establish a refinery in Trieste. The Austrian Diet wished to encourage manufacturing in its own province, in part, no doubt, because the tax on kerosene sold in Austria but refined in Fiume went to Hungary. Special concessions were available for a company which would undertake the enterprise. Standard Oil gave enough attention to the matter to receive reports on the industry in Austria-Hungary. One forwarded by J. C. Chambers evaluated the development of both pro-

ducing and refining and included the optimistic observation that "capital invested in the industry carefully and with economical and effectual working, and a good knowledge of the country will give a very large return."[51] In spite of this information, in 1888 Standard Oil executives declined to undertake refining in Trieste. Four years earlier they had refused an offer from the former Pennsylvanian, Dr. Herbert W. C. Tweddle, to purchase his integrated organization in Russia, "Standard Russe."[52] French investors grasped that opportunity.

ESTABLISHING FOREIGN AFFILIATES, 1888-1892

For some years the executives of Standard Oil had been considering adopting a more positive policy to meet the growing competition. Conditions in the late eighties obviously called for aggressive measures if the Trust was to retain a leading position in sales for world markets. While for many reasons producing and refining in Europe did not attract Rockefeller and his associates, the possibility of playing a part in marketing abroad had been discussed often by the Executive Committee.

Several factors in the second half of the 1880's called for a reconsideration of Standard Oil's selling policy for foreign consumption, especially in Europe, the most important market. Sellers of Russian kerosene were improving their marketing methods and enlarging their sales. The development of the tank steamer was revolutionizing the handling and transportation of petroleum. The application abroad of the American system of bulk distribution by tank cars, bulk stations, and tank wagons was a logical corollary. The new methods meant both an increase in efficiency and a reduction of unit costs in marketing, but they entailed heavy initial expenditures and the need for a large volume of sales if the economies were to be enjoyed.

The impact of Russian oil varied from one country to another, but the situation in the United Kingdom, the second-largest foreign national market for Standard Oil products, serves as an example of the American oilmen's problems. The proportion of that market enjoyed by kerosene from the United States dropped from almost the whole in 1883, the year of the first importation of Russian illuminating oil, to 70 per cent in 1888. Furthermore, the volume of American kerosene imported showed an absolute decline in 1888.[53] In that year Rothschilds subscribed to two new British corporations—The Kerosene Company, Limited, with the exclusive right to import Rothschilds' kerosene, and The Tank Storage & Carriage Company to store and distribute the product. Prominent in the

organization of these two companies was the strong mercantile and shipping firm of Lane & Macandrew, headed by Frederick Lane, who played a leading role in European oil circles for many years. The Nobels followed the Rothschilds' move by appointing Bessler, Wächter & Company as their exclusive agent in the British market.

For some time Standard Oil executives had been watching the developments in marine transportation with marked attention. Between 1862 and 1885, shippers had transported oil in tanks installed in either sailing ships or steamships. In 1881, Standard Oil, through National Transit Company, purchased the steamer *Vaderland*, which had been built nine years earlier for the Red Star Steamship Company. It was a combined passenger and tank ship, although it appears never to have served successfully in the petroleum trade. In the middle eighties the local scarcities of barrels in Eastern American ports gave an added impetus to experimentation with bulk transport of oil. At the same time, lack of other freights caused more steamers to carry barreled oil and demonstrated the fact that steamships could transport petroleum across the ocean with less danger, lower insurance rates, more speed, and more regularity than sailing ships. L. V. Sone, who had earlier sold his oil interests to Standard Oil, successfully applied his patented system of tanks to the *Crusader*. In 1885 he tried to interest Rockefeller and his associates in the patents on his steamer, but they considered the price too high.[54]

By that time bulk marine transportation had been more generally used in Europe. Faced with a shortage of appropriate wood in the vicinity of Baku and the resulting high prices for barrels, the Nobels and other shippers of Russian oil had turned their handicap into an advantage. They effectively used tankers on the Caspian Sea. The Black Sea Steam Navigation Company was credited with having the first ocean-going steamer to carry Russian oil in tanks, when, two years after the opening of the Baku-Batum railroad in 1883, the *Sviet*, built in Sweden, arrived in England. The next year an American consul was marveling at the rapid unloading, from a similar ship, of Russian oil for Nobels' agent, H. Rieth & Company, at Antwerp.[55]

The application of bulk marine transport to the Atlantic trade was soon carried a step further. Wilhelm A. Riedemann, the leading oil importer of Geëstemunde and Bremen, having successfully experimented with fitted tanks in a sailing ship, the *Andromeda*, and two other vessels of his fleet, ordered a new ocean-going steam tanker. Colonel H. J. Swan of Armstrong, Mitchell & Company, Newcastle-on-Tyne, designed the

Glückauf on the lines of a vessel recently built by his firm for the Russian oil trade. Launched on June 16, 1886, the new tanker carried oil in the skin of the ship rather than in tanks. With its engines situated aft, and the cargo space divided by one middle-line bulkhead and several transverse bulkheads, the three-hundred-foot steamer had a capacity of twenty thousand barrels of oil. Its first voyage to New York precipitated protests from the Knights of Labor, who anticipated the impact of the innovation on the work of longshoremen.[56]

Nonetheless, both the economies and the potential profits of tankers were extremely attractive. One tank steamer with a capacity of twenty thousand barrels and making seven trips across the Atlantic per year was equal to more than ten sailing vessels each carrying five thousand barrels and averaging two and a half trips a year. A well-equipped tanker could load in twenty hours, though five days were usually allowed. Savings of a twenty-thousand-barrel steamer in inspection of oil, barrels, stowage, stevedoring charges, and dunnage were estimated to be about $2,300 per loading. Steamship men claimed that the money saved in wharfage alone would easily "cover the expenses of extra crew, coal, and other items incidental to a steamer." It was estimated in 1888 that a tanker could transport oil at a fourth less cost than a sailing vessel carrying barrels; hence tanker rates set in relation to their competitors were at a profitable level. The returns on the innovation were large. Within six years of the *Glückauf's* maiden voyage about three-fourths of the total export of American crude oil and kerosene, other than that cased, was in bulk. Standard Oil Company of New York ordered a tanker at Chester, Pennsylvania, for the coastal trade in 1888, and the Trust set about acquiring an ocean fleet in conjunction with the organization of companies for marketing in Europe.[57]

At least as early as 1885 the top managers of Standard Oil had seriously considered participation in exporting and foreign marketing. Into their long discussions probably entered reasons similar to those which inspired their increased activity in domestic marketing, as well as references to the specific developments abroad and the possibility of profits from ocean transportation. Reports from Europe informed Standard Oil that some competitors were developing bulk distribution; if its customers did not act vigorously in like manner, they would be at a disadvantage. Although some European marketers of Standard Oil products had already taken a few steps in this direction, the Americans had the ready capital as well as the experience in American domestic trade to facilitate the change.

Rockefeller, taking some license with poetry, commented on the possibilities to the Executive Committee on June 6, 1885:[58]

> We are neither old nor sleepy and must "Be up and doing, with a heart for any fate;
> Still achieving, still pursuing, learn to labor and to wait."

They waited; three years passed before Standard Oil established in England its first foreign marketing affiliate. In his usual concise style, Archbold commented to Rockefeller on one of the reasons for the delay: "We have not moved too quickly with reference to the English situation. We ought to have gone there at least a year earlier. Mr. Brewster's conservatism did not help us on that question."[59] The conservative retired in 1888.

The Anglo-American Oil Company, Limited, the first of the Standard Oil Company's foreign affiliates, was organized on April 24, 1888, in close co-operation with 26 Broadway. The £500,000 capital stock was entirely held by the Trust. William Herbert Libby, Wesley Hunt Tilford, George Foster Gregory, and four Englishmen completed, under a charter dated 1887, the organization of the new company just twenty-four days after that of The Kerosene Company of the Rothschilds. One Englishman, J. D. Jamieson, was among the original managing directors, but much of the leadership in marketing, as contrasted with that in ocean transportation, came from the United States. Frank E. Bliss, former head of the Gasoline and Naphtha Department of the Pratt Manufacturing Company, contributed his skills. In 1890 one of Standard Oil's most dynamic marketers, James McDonald, agreed to go to England as a managing director.[60] He had been second only to his brother, Alexander, in the leadership of the Consolidated Tank Line Company. Until his retirement James played a leading role both in the marketing of Standard Oil products in the British Isles and as the general liaison man between New York and activities on the Continent. As Libby was the American architect of these foreign affiliates, so McDonald later was the tactful, although sometimes harried, pioneer in the most difficult task of developing joint management by Americans and Europeans of the foreign affiliates.

Under the terms of a broad charter Anglo-American plunged into the importing and marketing of petroleum products. The managing directors placed orders for tankers, retaining as consultant George Eldridge, who had managed Palmer & Company when it built the *Vaderland*. By 1892 three steamers—the *Bayonne*, the *Manhattan*, and the *Weehawken*—were

plying the Atlantic, title to each ship being vested in a separate company whose stock was held by Anglo-American. Through purchase of some plants and construction of many more, by 1892 the English affiliate owned and operated bulk storage facilities at London, Chalk Farm, Camberwell, Bromley-by-Bow, Manchester, Liverpool, Hull, Newcastle, Bristol, Leeds, Purfleet, Birkenhead, and Nottingham. In conjunction with the last three the company established works for processing some oils. Petroleum products were transported within the United Kingdom in company-owned tank cars and tank barges, and within two years of its organization the company operated forty tank wagons. While Russian oil had taken 34 per cent of the market in 1891, as compared with 30 per cent in 1888, Anglo-American had rapidly taken over the direct importing and wholesaling of American oil. In 1889 its deliveries of 299,100 barrels constituted 18 per cent of all American oil (1,613,800) delivered to jobbers and retailers in the United Kingdom; by 1891 Anglo-American's proportion had risen to 71 per cent (1,397,000 out of 1,961,600 barrels).[61]

In organizing affiliates on the Continent of Europe Standard Oil's top management adopted the views of their chief negotiator, W. H. Libby. He believed that with the exception of operations in Anglo-Saxon communities the Standard Oil men must form alliances with local merchants. "Allies wisely chosen are almost indispensable to our progress and prosperity," he reiterated.[62] The reasons were self-evident. Standard Oil possessed no direct knowledge of, or relations with, the wholesale trade in petroleum products in any of the countries. To compete quickly and effectively the Americans needed to start with established operating firms, the largest and best administered possible. The language and legal barriers could be most easily surmounted by citizens of the different countries. Only nationals could be familiar with the multitudinous regulations governing the oil trade. Warehousing and storage permits were so closely guarded that transfer of those already granted to a new company would be much easier than acquisition of them by foreigners. The ownership of tankers by several of the leading importers in the main ports of Belgium, Holland, and Germany afforded an added reason for alliance with these merchants.

The first Continental affiliate of the Standard Oil was built upon the business foundations laid by Wilhelm Anton Riedemann and Albert Nikolaus Schütte & Sohn. Riedemann, importer of American kerosene since 1865 and a pioneer in the use of tankers, had worked closely with the Schüttes, who held the most prominent position in the German

wholesale market for kerosene. The Deutsch-Amerikanische Petroleum-Gesellschaft (hereinafter called DAPG) was formed on the basis of an agreement signed on February 22, 1890, by Libby for the Standard Oil Company of New York with Franz Ernst and Carl Schütte, W. A. Riedemann, and Johann Heinrich Christoph Wiegand, attorney and later managing director of Norddeutscher Lloyd. Capitalized at 9,000,000 marks (equivalent to about $2,125,000) divided into non-negotiable voting shares, at first the new company was slightly less than 40 per cent owned by the Standard Oil. The German merchants contributed to the new business five steam tankers—*Glückauf, Minister Maybach, Willkommen, Gut Heil,* and *Energie*—warehouses, barreling plants, storage tanks, tank barges, tank cars, skilled employees, an intimate knowledge of their business, and inventive leadership. Standard Oil's participation assured regularity of supplies, ample funds for building an organization from the Rhine to East Prussia, and great skill in land bulk transportation and distribution.[63]

Under German management, with the advice of American experts, DAPG at once initiated a program of expansion. The two Schüttes and Riedemann, as managing directors, made their bulk distribution to customers in barrels not tank wagons, but they added tankers to their fleet, persuaded railways to lower rates on barreled oil, erected many new bulk stations, and, with the help of Henry Gerstenberg from the United States, improved their barrel repairing. DAPG purchased several wholesaling firms and concluded agreements with a number of other houses.

The most important agreement was one signed with a group of Dutch and Belgian merchants who later participated in the American Petroleum Company, the second Continental affiliate of the Standard Oil Trust. The object was "to fairly define a territory in which the respective parties" could "operate exclusively and without injury to the other." Perhaps one of Libby's most delicate assignments was to bring about a working arrangement between the groups which competed for the Rhenish trade. DAPG, Frederic Speth & Company of Antwerp, Horstmann & Company of Rotterdam and Amsterdam, and Hermann Stursberg & Company of Rotterdam all marketed in this area. In the preliminary agreement signed by representatives of the various firms on June 19, 1890, DAPG relinquished its trade in Holland and Belgium, on the left bank of the Rhine, and in some cities on the right. The Dutch merchants withdrew from trade in North Germany, sold their plant at Bremerhaven to the

German corporation, and leased to it their plant at Mannheim. DAPG retained its plant at Rotterdam for trade on the Rhine. The contract was only slightly modified after the formation of the American Petroleum Company on March 10, 1891.[64]

The American Petroleum Company, a Dutch corporation, brought together Standard Oil and the chief importers and wholesalers in Belgium and Holland. The American organization purchased 51 per cent of the stock issue of 5,000,000 guilders (equivalent to about $2,000,000). The new company, founded on the nucleus of several interlocking partnerships in Holland and of Frederic Speth & Company of Antwerp, at birth possessed tank installations at Antwerp, Charlois, Rotterdam, and Amsterdam, as well as other equipment to carry on wholesaling in Holland, Belgium, and part of the German Rhine country. (See Table 12.) It also owned twenty-three tank cars, a sailing ship, seven steam tankers,

Table 12 PROPERTIES BROUGHT INTO THE AMERICAN PETROLEUM COMPANY UPON ITS ORGANIZATION, 1891

Owners	*Property*
Hermann Stursberg & Company, Rotterdam Partners: Hermann Stursberg Otto Randebrock Francis W. Randebrock	50% Tank Rhinecraft Company 50% share in tank installations at Charlois
Hermann Stursberg, Otto Randebrock and Francis W. Randebrock	4 iron screw steamers: *Bremerhaven, Charlois, Chester, Ocean* (ranging from 1,851 to 2,179 tons)
Horstmann & Company, Amsterdam and Rotterdam Partners: William Otto Horstmann Hermann Friedrick Korhammer	50% Tank Rhinecraft Company 50% share in tank installations at Charlois 20 tank cars Several tank lighters Further equipment belonging "to the retail commerce at Amsterdam"
F. W. O. Horstmann	1 iron screw steamer *Mignon*
Frederic Speth & Company, Antwerp Partners: Frederic Speth Charles Good	1 steel sailing ship *Hainaut,* 1,718 tons 2 steel steamers: *La Flandre,* 1,509 tons *La Campine,* 2,087 tons 3 railway tank cars Tank installations at Antwerp

Source: SONJ, copy of American Petroleum Co. statutes, Mar. 10, 1891, Article 33.

and the Tank Rhinecraft Company with its tankship, *Petrolea.* Management resided in the hands of five experienced Dutch and Belgian directors—Otto and Francis W. Randebrock, William Otto Horstmann, Frederic Speth, and Albert Maquinay—who reported to a group of "commissaries" at 26 Broadway.[65]

During the same year, 1891, two companies were organized for the Italian petroleum trade. Standard Oil subscribed 60 per cent of the 2,500,000 lire (about $500,000) capital of Società Italo-Americana pel Petrolio. The company was organized May 16 on the foundation of Walter & Company, which owned the steamer *Marguerite* and merchandising facilities in Venice, Savona, and other points in northern Italy. Carlo Wedekind & Company of Palermo was a closely associated firm. Most supplies for Italo-Americana were carried in the tanker *Sophie,* owned by the Aktien Gesellschaft Atlantic, a German corporation, organized on July 6, in which the Standard Oil Trust held 60 per cent of the capital of 500,000 marks.[66]

Standard Oil's method of entering the Scandinavian market differed from that used in other Continental countries: it bought a minority interest (21.45 per cent) in an established corporation. Late in 1891 the directors of Standard Oil Company of New York approved the agreement signed by W. H. Libby for the purchase of 120 shares (out of 560 of 5,000 kroner each) of the stock of Det Danske Petroleums-Aktieselskab. That company had been organized as a result of an agreement between leading Scandinavian merchants (Jörgen Jensen, Johannes M. Holm, and Rudolph Wulff), dated November 30, 1888.[67] It was to be many years before American marketing methods would have much impact in Northern European countries.

Participation by Standard Oil in marketing companies in Canada was also moved a step further after 1887. The Eastern Oil Company, a New Brunswick corporation capitalized at $50,000, was founded in 1888 on the business of Joseph Bullock & Sons, importers and wholesalers at St. John. The partners in the older firm contributed their business and plant, and the Standard Oil Trust $32,500 in cash. Two years later The Bushnell Company, Limited, was formed on the basis of Bushnell & Company mentioned earlier. The new corporation issued half of its $100,000 authorized stock, and the Trust purchased the entire issue. The Bushnell Company took over a refinery in Sarnia, apparently that of the scientist Herman Frasch, but functioned primarily as a marketing outlet of New York Standard. These measures strengthened the hand of Standard Oil in

competition with the leading Canadian corporation, The Imperial Oil Company, Limited, with which a friendly connection, under discussion in 1890, was not achieved.[68]

The Anglo-American Oil Company, Limited, served as the instrument for a change in policy instituted in 1890 for the Far East. In that year the British company began to consign in its own name Standard Oil products to merchants in all the leading ports east of Suez. In the past most of these products had been sold to merchants or agents on the American Atlantic seaboard, where the responsibility and control of Standard Oil ended. Now, through its English affiliate, Standard Oil's possibilities of loss or profit extended to the stations of commission merchants in Madras, Calcutta, Singapore, Shanghai, and Yokohama.[69]

The Executive Committee had taken two other steps incidental to the more aggressive marketing measures adopted between 1887 and 1892. Meissner, Ackermann & Company was liquidated in 1890.[70] As a reflection of that change and of the decision to participate actively and openly in foreign marketing, by 1892 both C. F. Ackermann and Livingston Roe had become employees of the Trust and, together with G. F. Gregory, members of the enlarged Export Trade Committee. Thereby Rockefeller and his associates focused the attention of two experts in foreign trade and of one in tank-wagon distribution on the expansion of Standard Oil sales against the growing competition in Europe and Asia.

Writing to the American Ambassador in Germany in 1891, Libby gave the reasons for the new policy in foreign marketing and reported on its success in Europe. Standard Oil's policy had been "that of competitive commerce," "dictated and stimulated by the desire to sustain the consumption of American petroleum." In Europe, he reported, Standard Oil had "been fortunate enough to secure the co-operation of a coterie of well-known merchants" who had been "long and prominently identified with the Petroleum Commerce of the Continent." As Standard Oil's representative explained, the new departure was intended to develop a large, permanent, and "fairly remunerative" business, and had "none of the sinister and ulterior designs" which had "agitated" the minds of critics of Standard Oil.[71] The establishment of foreign affiliates perhaps marked the high point of Libby's career, although he remained the ambassador of Standard Oil for many years and went on the Jersey Standard board in 1915. The policy which he activated certainly constituted one of the sharpest changes in Standard Oil's foreign relations.

Had he so desired, Libby could have told the American Ambassador to

Germany that the battle was far from won—that there was to be no rest for the Standard Oil combination in foreign markets. Although Standard Oil statisticians reported that exports of American kerosene had risen from 10,728,400 barrels in 1888 to 12,508,700 in 1891, Russian exports had increased from 3,087,000 to 5,129,900 in the same period. The United States and Russia were the only significant exporters of petroleum products. While the American share of the world export trade in illuminating oil had declined from 78 per cent to 71 per cent, the Russian had risen from 22 per cent to 29 per cent. Even more disturbing to American managers and stockholders was the fact that the total value of American exported kerosene in 1891 was lower than in either 1888 or 1882.[72] Through affiliates in Europe, Canada, and Mexico, and through consignments to the Orient, Standard Oil was participating in sales abroad and exercising varied degrees of influence over marketing. In South America, Australia, and Africa, however, American petroleum products still went to consumers through outside merchants. Obviously, more strenuous efforts were required to meet competition from Russian and other oils all over the world.

In spite of all these reservations, by 1892 Standard Oil executives could point with pride to their achievements during a highly competitive decade in the foreign marketing of American petroleum products. Early in the period they had expanded sales by intensifying old methods of marketing. When these proved unsuccessful in halting the upsurge of Russian oil, Rockefeller and his associates had then embarked upon a policy of participating in marketing corporations abroad, especially in Europe. Utilizing Standard Oil capital, they had sustained the sales of American kerosene by helping to apply and to organize American methods of bulk distribution and by taking advantage of the revolutionary new method of water transportation—the steam tanker. Standard Oil had taken the lead in retaining for the United States about 70 per cent of the world's export trade in illuminating oil and in quadrupling foreign sales of American lubricants during the years 1882 to 1891.[73] Although the members of the Executive Committee had not moved quickly in initiating their new policies abroad, they had proceeded with notable energy and system once they had started. They could truthfully assert that without the Standard Oil Trust, or some similar large combination of American capital and experienced oilmen, American petroleum products would certainly not have retained, against the rivalry of the Nobels, Rothschilds, and other

operators in Russian oil, so large a proportion of the world's markets. No one could deny that the maintenance of foreign sales was of paramount importance not only to Standard Oil but to the entire American petroleum industry as well. Impressive, too, was the fact that these accomplishments came in the same years that the conquest of Lima crude and full vertical integration necessitated even larger outlays of capital at home.

Chapter 6

Conquering Lima Crude, 1886–1892

DURING THE years 1886 to 1892 Standard Oil executives had to adjust their thinking and their policies to a disturbing number of changes in the petroleum industry. Competition with Russian petroleum and other foreign production led to changes in policy portrayed in the preceding chapter. In the late eighties Standard Oil was faced by disgruntled producers in the Appalachian regions and was concerned at the decline of production there. At the same time, the emergence of the new Lima-Indiana field, outside the Appalachians and yielding a different type of petroleum, posed the necessity not only of developing new manufacturing processes but of deciding what policy to pursue in regard to production, purchasing, piping, and storage of the new crude oil. Further heavy investments in fixed plant for piping, storing, and large-scale manufacturing placed executives under greater obligation than ever to assure a steady supply of raw materials and an effective sales mechanism for channeling the increasing flow of diverse products into markets at home and abroad. This chapter deals with Standard Oil's policy toward Lima-Indiana crude oil, and the following one with other changes in the years under review.

ISSUES RAISED BY SULPHUR-BEARING CRUDE

Starting in 1886, Standard Oil executives were adapting their system of operations to an entirely new kind of petroleum found in a geographically distinct area—northwestern Ohio and northeastern Indiana. Much of the previous success of the combination had been attributable to the production of the relatively invariable Pennsylvania-grade petroleum in the relatively restricted Oil Regions of Pennsylvania and New York. The new territory produced an ill-smelling, sulphur-laden crude which defied established methods of manufacturing marketable petroleum products. Lima-Indiana petroleum offered a challenge to the desire of Standard Oil men to stabilize the industry not even second in importance to the menace of competition by foreign production in markets abroad.

Petroleum production in northwestern Ohio arose from a search for

natural gas by small drilling operators near Findlay, Ohio, in 1884. The favorable results of their efforts attracted emulators, one of whom produced an oil well, not a gasser, near Lima in May, 1885. This gave impetus to further drilling, which culminated in the Citizens' Well, the first commercially profitable petroleum venture in the northwestern Ohio area. More than 250 wells had been drilled by the end of 1886.[1] Within another two years the new field was producing more than 35 per cent of all the crude oil in the United States; it maintained an output above 32 per cent until 1892. (See Table 13.)

Table 13 LIMA-INDIANA PRODUCTION IN RELATION TO THE TOTAL PRODUCTION OF CRUDE OIL IN THE UNITED STATES ANNUALLY, 1886-1892

In barrels of 42 gallons

	Production		*Lima-Indiana*
Year	*Total United States*	*Lima-Indiana*	*Percentage of Total*
1886	28,064,841	1,064,025	3.8
1887	28,283,483	4,650,375	16.4
1888	27,612,025	9,682,683	35.1
1889	35,163,513	12,186,564	34.7
1890	45,823,572	15,078,378	32.9
1891	54,292,655	17,452,612	32.1
1892	50,509,657	15,867,575	31.4

Source: *Mineral Resources, 1892,* 634, 641.

Though the Standard Oil group was responsible for much of the development of the Lima-Indiana field, executives moved into the area slowly and cautiously. The correspondence of John D. Rockefeller contains only a few references to Lima oil during 1885, and no positive policy was adopted until the second quarter of the next year. As late as June 1, 1886, Archbold reported to Rockefeller that W. T. Scheide, National Transit's field manager of gathering operations, was urging that "the early and very careful consideration of the subject of a comprehensive policy with reference to the field must be had by us."[2] But too many considerations had to be weighed for the Executive Committee to act precipitately.

In fact, small competitors appeared in northwestern Ohio before Standard Oil men could make up their minds what to do about Lima oil. One of the earliest, the Edwards Oil & Burner Company of Chicago, pointed the way to the potentialities of the new crude oil; it laid a line from the Citizens' Well to a local paper mill, which used the crude petroleum as fuel in Edwards burners. A former employee of the Con-

tinental Oil & Trading Company on the Pacific Coast, Edwards was well versed in the utilization of petroleum as industrial fuel. In February, 1886, he suggested that his firm should erect a plant to manufacture fuel oil, Ohio Standard to take the top distillates for refining and marketing.[3] Standard Oil men did not adopt the idea, but the episode demonstrated the fact that competition in the new field could not be ignored. It might well be as unrestrained and chaotic as in the early days of the Oil Regions, with resultant demoralization of the market.

The obvious alternative was for the Standard Oil combination to enter the field. If Rockefeller and his associates were to continue to maintain the pre-eminent position of the Trust in the American petroleum industry, and to use that pre-eminence as a profitable stabilizing factor, they must at least buy oil, lay pipes, and erect storage tanks in northwestern Ohio. In addition, they would certainly have to connect the system in the Lima region by trunk lines to Cleveland, and probably to the long-distance lines running to the Eastern refineries. That policy in its simplest form would involve the expenditure of millions of dollars, a fact that would give the executives pause but would not stop the investment if they knew what to do with the oil.

Lima crude possessed two deleterious characteristics: (1) sulphur compounds in solution, and (2) a smaller percentage of the combined lighter fractions than Pennsylvania-grade petroleum. The volume of sulphur, which ranged from .5 per cent to 1 per cent of the total and averaged about .65 per cent, was quite enough to impart a skunklike odor to the crude oil, which was very similar to the petroleum produced across Lake Erie in Ontario. The most advanced processes for refining the Canadian crude, probably best exemplified in the practices of The Imperial Oil Company, Limited, after 1880, cost at least ten cents more per barrel than for Pennsylvania-grade oil and yielded an illuminating oil of inferior quality; enough sulphur remained to cause smoking and relatively quick encrustation of wicks and to induce darkening in color upon the application of heat. Furthermore, commercial refiners of "sour" crude were unable to get a yield of more than 57 per cent of deodorized kerosene and naphtha combined, instead of the 75 per cent or more of illuminating oil alone from Pennsylvania petroleum.[4] Not only, therefore, would the kerosene manufactured from Lima crude, if existing processes were used, be inferior in quality to that upon which the Standard Oil reputation had been built, but the cost would also be higher.

Benjamin Brewster, vacationing in London, struck right to the core of

the issue. "The matter of Ohio oil is, it seems to me, important and *on its manufacturing value* hinges our policy," he wrote. "We can not afford to allow any one else to handle it, neither can we afford to load ourselves with it, at a price above its value—The question is—How to utilize it & where?" Then he applied to the problem at hand the approach of Standard Oil executives to all issues: "We can afford to spend time & money on [the problem] to answer [it] intelligently."[5]

The whole situation dictated a policy of cautious action. Attempts at Standard Oil plants in Cleveland, Oil City, and elsewhere to manufacture satisfactory products from Lima crude during the first six months of 1886 failed miserably.[6] To hold their major markets Standard Oil managers had to manufacture not only acceptable kerosene but specific qualities of kerosene to which consumers had become accustomed. Companies in the combination had to concentrate on refining Pennsylvania-grade petroleum, which called for an adequate supply from Appalachian wells, until a commercially feasible method of manufacturing a marketable kerosene from Ohio crude could be found.

STANDARD OIL'S FIRST STEPS

Meanwhile, the rapid drilling of wells in northwestern Ohio called for some immediate action. If Standard Oil was to attempt to stabilize production in the new field and to extend its dominance to that area, the combination had to begin purchasing, piping, and storing petroleum at once. It would also have to give attention to methods of refining and marketing the crude oil.

Pending decision on a comprehensive policy, the Executive Committee authorized the laying of pipes to wells and the erection of storage tanks in Ohio. The gathering and storing system was established by The Buckeye Pipe Line Company, organized on March 31, 1886. All of the $100,000 capital of the new company came from National Transit, whose men also conducted the construction program under the leadership of Calvin N. Payne. Buckeye took its first oil for storage in May. Four months later it had six huge tanks available for the purpose and continued rapid building thereafter. Within a short time branch lines extended to Toledo, St. Mary's, and Cygnet. Early in 1888 Standard Oil pipelayers adopted the use of a steam-powered pipe-screwing machine which enabled thirty men to do the work formerly done by a hundred. By the end of that year Buckeye was building both a gathering system in northeastern Indiana and a trunk line connecting it with the Ohio transporting and storing

units. These construction activities had utilized original capital and had occasioned a loan of $1,549,310 from the National Transit Company.[7] In those early years Buckeye collected and stored more than 85 per cent of the total produced in the entire field, as Table 14 indicates. The technical and operating efficiency of Standard Oil had stood the test of handling the flow of Lima crude and had made possible the rapid development of the field.

Coincidental with the establishment of a gathering and storage system, Standard Oil executives extended their purchasing mechanism, in a modified form, to the new producing area. In June, 1886, Joseph Seep's agency began to buy all oil taken into the tanks of The Buckeye Pipe Line

Table 14 OPERATIONS IN LIMA-INDIANA CRUDE OIL BY THE BUCKEYE PIPE LINE COMPANY, 1886-1892

In barrels of 42 gallons

		The Buckeye Pipe Line Company		
Year	*Total Annual Production of Lima-Indiana Crude*	*Runs*	*Shipments*	*Net Stocks End of Year*
1886	1,064,025	[a]	[a]	[a]
1887	4,650,375	4,684,139[b]	751,325	4,148,469
1888	9,682,683	8,899,004	3,053,068	9,810,714
1889	12,186,564	10,255,752	5,801,928	14,105,149
1890	15,078,378	11,918,910	6,199,306	20,971,395
1891	17,452,612	14,515,770	12,154,865	22,103,705
1892	15,867,575	13,657,737	16,504,880	18,604,442

[a] Data not available.
[b] Apparently includes runs made in 1886.
Source: *Mineral Resources, 1892,* 634, 641, and *Mineral Resources, 1894,* 356-357.

Company. No certificates were issued until 1890 and then only on an experimental basis for a short time. The initial price paid for Lima crude, as yet not refinable, was forty cents a barrel, or twenty-six and a half cents less than the average paid during the same month for well-tried Pennsylvania nonpremium oil. Seeking a price that would discourage a flood but would induce Ohio producers to maintain a flow of oil, at irregular intervals the Executive Committee lowered the offering price per barrel, to the low point of fifteen cents on July 20, 1887.[8] Since extracting costs were low, Lima producers made a profit even on fifteen-cent oil, with the result that the supply far exceeded consumption until 1892 (see Table 14) and kept Buckeye Pipe Line tank builders continually busy.

Having committed themselves to an extensive program of purchasing

and storing Lima crude, Rockefeller and his associates next engaged the outstanding researcher on "skunk oil" in North America to solve the problem of eliminating sulphur from refined petroleum products. This selectee was Herman Frasch, known to associates as the "flying Dutchman." A German-born, energetic, persevering empiricist, Frasch had learned the rudiments of chemistry in the *gymnasium* at Halle before migrating to the United States in 1868. Within six years he had concentrated his experiments on processing petroleum in his own laboratory at Philadelphia. In 1877 he received a patent for an improved method of refining paraffin, which he apparently sold to the Meriam & Morgan Paraffine Company, a Cleveland firm in which Ohio Standard had placed a substantial investment as early as 1874. Locating in Cleveland and working in partnership with J. B. Meriam and William Morgan, Frasch proceeded to invent and patent, both in the United States and in Canada, improved methods of distilling petroleum and manufacturing paraffin. In 1882 the three partners sold the exclusive use of the improvements in distillation in Canada to The Imperial Oil Company, Limited, for cash and stock. As an employee of that company and also in partnership in another venture with John R. Minhinnick, a leading figure in Imperial, Frasch spent from 1884 to 1886 seeking means of manufacturing kerosene from the sulphurous Ontario crude, similar to that found across Lake Erie in northwestern Ohio.[9]

When Frasch reported for duty with Ohio Standard at Cleveland on July 1, 1886, he immediately began to apply lessons he had learned in Canada. His basic concept was simple—to unite the sulphur in solution with a metallic oxide, thereby forming as a precipitate an insoluble sulphide which could easily be separated from the oil. For the purpose oxides of lead, bismuth, cadmium, mercury, iron, copper, or silver might be used, as the inventor explained in his application, dated February 21, 1887, for a patent on the process.[10]

The first trial runs, however, did not yield a kerosene free from a tendency to smoke, and several additional problems soon appeared. What oxide or combination of oxides would perform the task most inexpensively and most efficiently? Could the sulphur be precipitated in the original distillation or would it be done more effectively in a redistillation of the kerosene distillate? What type of mechanical agitation should be utilized to assure optimum opportunity for the formation of metallic sulphides, and how should the arms of the agitator be kept cool enough to obviate warping? And what arrangement should be developed for the revivification of

the sulphide compound in order that the oxides might be used again and again as a means of keeping costs low? These problems of technology, tied in with those of quality and cost of kerosene, occupied Frasch's attention for several years.

Within sixty days after starting the Frasch operations, known as the "Herman Experiment," the Executive Committee further implemented John D. Rockefeller's thought that "we must feel our way along" with reference to the oil and gas business in northwestern Ohio. On August 10, 1886, in order to produce, pipe, and sell natural gas from the Findlay-Lima field to Toledo and neighboring cities, the National Transit Company joined Charles Foster and others in organizing the North Western Ohio Natural Gas Company. The Standard Oil proportion was approximately three-fifths. Toledo was illuminated by natural gas for the first time on May 13, 1887, Lima three months later.[11]

Also during the month of August, 1886, Standard Oil executives began constructing a refinery to process "sour" crude. In response to suggestions from Daniel O'Day, the new plant was located at Lima. On December 6 of the same year The Solar Refining Company, a $500,000 Ohio corporation, was organized to own and operate the Lima Refinery. The Trust itself held all the shares. Frank Rockefeller served as president, George F. Southard, a methodical administrator from the Atlas Works at Buffalo, was the vice-president in charge, and the general superintendent was ebullient and inventive John W. Van Dyke, who came from the Kings County Works of Sone & Fleming. As soon as the Solar plant had initiated operations in 1887, these men utilized a modification of the well-known litharge (lead oxide) process, based in part at least upon the patent taken out in 1882 by Thomson McGowan, an inspector and experimenter who was accorded space and equipment in the Cleveland plant of Ohio Standard for many years. At the same time Lima became the focal point of Frasch's experimentation, his aide being the resident chemist and inspector, Clarence I. Robinson, a graduate of Cornell University, recently transferred from Olean and later to set up the first experimental laboratory at the Bayonne Refinery.[12]

By 1887 members of the Executive Committee were faced with a serious problem arising from their decisions regarding northwestern Ohio during the previous summer. They had initiated the production and distribution of natural gas and had launched the gathering, storing, purchasing, and refining of Lima petroleum. The difficulty lay in the fact that Herman Frasch had failed to live up to hopeful expectations that he could quickly

devise a commercially profitable process for manufacturing marketable light products. Consumption of Lima crude was negligible, stocks above ground mounted rapidly, and the size of the investment in the whole operation soared. The situation called for a temporary measure to ease the pressure on the Standard Oil treasury.

At the suggestion of O'Day, Scheide, C. N. Payne, and Seep, Rockefeller and his associates decided to build a large market for Lima crude oil as industrial fuel. They seized the initiative from small sellers of Ohio petroleum for fuel and built upon the experience of previous users of Californian and Russian petroleum. Standard Oil men conducted various experiments during 1887 and appointed a manager for fuel oil sales—Charles W. Owston. Formerly superintendent of the George P. Smith Farm at Franklin, Pennsylvania, he first had his headquarters in Cleveland, but his salary was carried on the books of New York Standard by 1891.

Using various methods, Standard Oil men developed a market for fuel oil. Under Owston's guidance, oil-burning appliances utilized in Russia were studied, adopted, improved, and installed as a means of promoting sales. Gilbert & Barker began the manufacture of industrial fuel-burning apparatus in 1889. The Fuel Oil Department sold directly from storage tanks to industrial consumers and indirectly through Standard Oil marketing units. To facilitate the selling operations, an eight-inch trunk line for crude oil was laid from the producing areas of Indiana to Chicago in 1888, and steamers soon carried the new fuel to ports on the Great Lakes. To introduce the product in competition with coal, Owston and his men gave away thousands of barrels of petroleum as samples and consistently sold fuel oil at a loss, the figure for 1891 being $1,194,743. Among the largest buyers were steel and brass companies, rolling mills, and glass, brick, pottery, and wagon manufacturers. In spite of many successful experiments, railroad companies found coal too inexpensive to warrant conversion of locomotives to oil burners at that time. Even as early as April, 1888, however, Standard Oil could advertise that its fuel oil was being supplied to manufacturing establishments in 217 cities located in 20 states and territories. By 1891 Standard Oil men had 70 per cent of the business.[13]

When Americans had a petroleum suitable for use as fuel on the basis of cost and quality they could act as vigorously as the Russians in that field! Through the Fuel Oil Department, Standard Oil men developed and systematized a substantial market for petroleum products as industrial

fuel in the late eighties—a significant new departure mothered by the necessity of the situation.

SUCCESS IN THE NEW FIELD

Meanwhile Herman Frasch had conquered Lima crude.[14] "We are pleased to advise you that by experimenting with the Frasch process we have succeeded in producing a merchantable oil,"[15] wrote F. B. Squire to John D. Rockefeller in mid-October, 1888. With the help of Southard, Van Dyke, and Robinson at Lima and others at Cleveland the researcher had arrived at a process for removing the sulphur. After the usual primary distillation in a crude still, the light-products distillate and an oxide compound (two parts copper oxide, one part lead oxide, and two parts iron oxide or plaster of Paris) were placed in a cheesebox still of one thousand to twelve hundred barrels capacity—the "sweetening still." During the redistillation a mechanical agitator, consisting of stirrers, moved constantly. The resultant kerosene, having been treated with sulphuric acid and alkali, carried too little sulphur to impair the burning qualities of the oil. The precipitated sludge in the "sweetening still" was removed, freed of oil by filter-pressing and burning, and then restored to its original form by being roasted in a McDougal furnace and crushed, ground, and sifted in a millhouse. Frasch received patents, which were assigned to Solar Refining, upon the process, paraphernalia, and roasting furnace in 1889 and 1891.

Even after Frasch's initial success in 1888, several operating problems had to be solved. Refiners had to determine the exact amount of compound best adapted to different "sour" crudes—North Lima, South Lima, Indiana, Ontario, and other local varieties. To manufacture Water White kerosene, and such brands as Headlight and Eocene, adjustments had to be made in the application of the treating agents—sulphuric acid and caustic soda.

These and other modifications of basic procedures were all directed toward manufacturing a kerosene which would compete not only with the product of other refiners of Ohio oil but also with illuminating oil from Appalachian petroleum on all counts—appearance, burning qualities, and cost. Several developers of processes had appeared, the Penn method being used by the Craig, Paragon, and Sun companies in near-by Ohio cities. Such activities by competitors necessitated haste, secrecy, and the creation of superior methods by Frasch and his associates. After Saybolt had tested competitors' kerosenes in 1890, F. Q. Barstow wrote John D.

Rockefeller that the quality seemed "very unsatisfactory," and the Ohio Standard executives told the Executive Committee at 26 Broadway: "We surely cannot consent to marketing oil similar to that placed by our competitors. We have spent too much money and time to educate the trade, so that they understand the good quality and merits of our goods, to throw it away now."[16]

In the meantime, at the insistence of Standard Oil officials that their costs be reduced still further, Frasch devised in 1889 a method and apparatus originally planned for removal of sulphur from petroleum during the primary distillation. Known to Standard Oil men as the "Herman Vapor Process," this alternative attack on sour crude involved the use of the patented compound stirred continually by a revolving brush in a cylinder placed on top of the crude still. The sulphur was removed as the vapors passed through the cylinder on the way to the vapor lines and condenser. The brush method was installed on cylindrical "sweetening" stills at Lima and in a gigantic new plant near Chicago in 1889-1890.

Unfortunately, the machinery used in the vapor process proved cumbersome and expensive. Breakdowns occurred frequently. Standard Oil soon had to return to the original Frasch method—rerunning sour distillate in cheesebox stills in which mechanical agitators slowly stirred it and the copper oxide compound.

Even before Frasch had attained his apparent success with the vapor process, but after the feasibility of his first method was assured, Standard Oil executives had embarked upon the erection of the largest refinery in the United States—that at Whiting's Crossing, seventeen miles from Chicago. The site was strategically located near the supply of Lima-Indiana crude, yet on a water highway (Lake Michigan) and within the switching limits of the leading railroad distributing point for the entire Midwest. Construction began in May, 1889, under the supervision of W. P. Cowan, a phlegmatic, chubby, walrus-mustached protégé of Ambrose McGregor. As planned, the refinery was to have eighty crude stills with a daily capacity of 36,000 barrels. Title to the real estate and construction in the plant were conveyed to a new corporation, Standard Oil Company (Indiana), capitalized at $500,000 and headed by James A. Moffett, an impetuous, inspiring, driving executive with experience at Parkersburg and the Pratt Works. Though the intention was to use the vapor method, the first crude was run by the litharge process on September 2, 1890. Before the end of the following year the plant included nearly one hundred houses for more important men and works for re-

fining naphtha, gasoline, and kerosene, for distilling tar, for making lubricants, for pressing paraffin, for fabricating and filling cans, and for manufacturing barrels and acid.[17]

Whiting was a name to conjure with in the oil industry during the 1890's. Although the Solar Refinery was the first to utilize Frasch methods commercially, Whiting was so much larger that it came to symbolize the victory of Standard Oil over Lima crude and the first large-scale fusion of chemical knowledge and practical experience in the American petroleum world. "In its magnitude and symmetry," wrote Archbold at the conclusion of an inspection trip in 1891, the construction at Whiting "far exceeds anything that we have." It seemed to him "almost impossible to comprehend a concern capable of distilling 36,000 barrels of crude oil a day."[18] And within a short time the Whiting Refinery took over the supplying of almost the entire market for Standard Oil products in the whole Mississippi Valley, thereby auguring the relative decline of the combination's refineries in Cleveland and in the Appalachian region. Inside the Standard Oil organization, the Whiting Works stood as the most conspicuous monument to the policy of having ample funds available for use when needed.

The construction of Whiting had depended on the result of planned research which itself was unusual in extent. Several Standard Oil companies, of which Solar Refining bore the largest burden, had expended almost $200,000 on the "Herman Experiment," exclusive of new construction. This was a large outlay for experimentation at the time, inside or outside Standard Oil.[19]

The investment at Whiting and in the Frasch experiments actually represented only a small portion of the total placed on the altar of Lima-Indiana crude by the Standard Oil Trust. New properties embraced purchased oil, pipelines, storage tanks, producing areas, the Solar plant, and a large inventory of a wide range of manufactured products.

The first and largest single investment was in pipelines and storage facilities. By the end of 1891 the pipeline system, originally constructed and financed by National Transit, extended to all parts of the Lima-Indiana field and carried crude to Whiting, Chicago, Lima, Toledo, Cleveland, and points east. The Buckeye Pipe Line Company, by then a $6,000,000 corporation, owned all the gathering systems in both Indiana and Ohio, and a part of the trunk lines in the latter. The Indiana Pipe Line Company, organized with a capital of $500,000 in 1891, took over both the first eight-inch fuel line and a supplementary six-inch line to

Whiting, laid during the previous year. The Connecting Pipe Line Company, a small creation of 1888, held the trunk pipes between the Indiana and Buckeye systems. The latter interlocked with the old National Transit system through the $1,200,000 Cygnet Pipe Line Company, holder of trunk pipes from Cygnet to Mantua and a branch to Cleveland. Finally, to differentiate the old National Transit system carrying Western oil from those transporting Appalachian petroleum, certain lines in northwestern Pennsylvania running between the Ohio and New York borders via Colegrove and Kane were organized in 1889 into the $1,000,000 Northern Pipe Line Company.[20] That arrangement was the signal that Lima-Indiana crude was almost ready to run to refineries at Olean and Buffalo and would soon be moving to plants at Bayonne and Philadelphia.

The Standard Oil Trust had also invested heavily in producing properties in the Lima-Indiana region, a subject considered in the next chapter. Sufficient to the present point at issue is the fact that by the end of 1891 Standard Oil's investment in producing "sour" crude exceeded $8,000,000.

There were times when the extent of the activities in Ohio, and uncertainty as to the results, placed a heavy strain on the executives of Standard Oil. During the financial stringency in the autumn of 1890 the conservative Pratt, thinking that the Trust was "aggregating an unwise investment in Ohio," and backed by other members of the Executive Committee, including the usually daring Rogers, got "to the point earnestly of urging" that Standard Oil not only cease buying new producing territory but even discontinue purchases of crude oil in Ohio.[21] This period of serious doubt came just before the operations began to show fruits.

All told, as of December 31, 1891, Standard Oil accountants estimated that the Trust, either directly or through its affiliates, had profitably invested more than $32,000,000 in the "Ohio Crude Business." Detailed analysis for 1891, the last year of this period, is shown in Table 15. Profits ranged from plus 57 per cent on investment in pipelines to minus 144 per cent on the sale of fuel oil. Creating a market for a new product was costly, but the figure of 13.42 per cent for over-all earnings was satisfactory, though not excessive as profits of innovation.[22] And Rockefeller and his associates on the Executive Committee had certainly played the role of innovative entrepreneurs in Lima-Indiana crude; in six years on that project they had ventured an amount exceeding three-fifths of the net assets of the entire Trust on January 2, 1882.

Table 15 STATEMENT SHOWING RESULTS OF STANDARD OIL INVESTMENT IN LIMA-INDIANA CRUDE OIL FOR THE YEAR 1891

	Average Capital Employed for the Year	*Profit or Loss*	*Percentage Profit or Loss to Capital*
Buckeye Pipe Line Co., The	$ 5,108,827	$3,689,901.91	72.226
Connecting Pipe Line Co.	279,052	267,850.13	95.986
Cygnet Pipe Line Co.	1,128,532	479,664.07	42.503
Indiana Pipe Line Co.	1,764,116	1,014,557.55	57.511
Northern Pipe Line Co.	1,287,961	37,697.56	29.270
Total of Pipelines	$ 9,568,488	$5,489,671.22	57.372
Ohio Oil Co., The	7,980,912	610,122.36	7.645
Loss by Speculating Land & Lease a/c		(597,558.58)[a]	(7.487)
Jackson Oil Co. (six months)	113,113	(17,969.65)	(15.886)
Total of Producing Properties	$ 8,094,025	$ (5,405.87)	(0.067)
Solar Refining Co., The	2,237,071	371,091.31	16.588
Standard Oil Co. (Indiana)	5,082,300	796,525.71	15.672
Total of Refining Interests[b]	$ 7,319,371	$1,167,617.02	15.952
Crude Dept. S. O. Co. of New York exclusive of Buckeye Certificates	1,912,373	(217,057.05)	(11.350)
Buckeye Pipe Line Certificates 15,000,000 bbls.	4,500,000		
Shortage & Interest		(1,316,250.00)	(29.250)
Gain in inventory price on 8,000,000 bbls.		400,000.00	8.888
Total of Crude Dept.	$ 6,412,373	($1,133,307.05)	(17.674)
Fuel Oil Dept. S. O. Co. of New York	828,109	(1,194,742.85)	(144.273)
Grand Total	$32,222,366	$4,323,832.47	13.419

[a] Parentheses indicate losses.
[b] This category does not include results of small refining operations in Ohio crude by The Standard Oil Co. (Ohio).
Source: SONJ, Consol. Accts. of S. O. Trust, 1891. Additional figures given are: purchases by Crude Dept. for year, 14,421,633 bbls.; sales and deliveries of Crude Dept. for year, 12,384,748 bbls.; total runs by Buckeye Pipe Lines, 14,515,770 bbls.; total profit per bbl. on 14,421,633 bbls. purchased, 29.982 cents ($4,323,832.47 total).

From several angles of evaluation the conquest of Lima crude by Standard Oil was an accomplishment of major significance. In extending the policies of the combination to the Lima-Indiana area, Rockefeller and his associates had embarked on a comprehensive program for purchasing, producing, collecting, storing, transporting, refining, and distributing sulphur-bearing petroleum and its derivatives. The risk had been great

and the initial investment extremely large for the petroleum industry of the period. For the first time American refiners had relied heavily on chemical research and engineering skill for the solution of a problem. As a result of Frasch's success in refining "sour" crude, the Standard Oil combination received and fully utilized patents granted by the federal government. That patent monopoly constituted the foundation for the large earnings of several Standard Oil units for more than fifteen years. While awaiting the outcome of the research program, Standard Oil men had built the first large market in the United States for petroleum as industrial fuel. By these measures the combination had maintained its dominance over the American petroleum industry. To use the concept of Standard Oil men, they had extended their stabilizing services to a new and geographically distinct producing area, had provided a ready market and storage capacity for a flood of petroleum, and had encouraged the relatively orderly development of the Lima-Indiana field. Moreover, they had done all this while facing an entirely different set of circumstances in the Appalachian region.

Chapter 7

Achieving Full Vertical Integration, 1886–1892

WHILE EXECUTIVES of Standard Oil were directing much of their attention to the conquest of sour crude, conditions in other phases of their business also insistently called for decisions. Numerous circumstances in the Appalachian region as well as in the Lima-Indiana field induced Standard Oil managers to re-examine their previous policy of slight participation in production of crude petroleum. Pipeline and manufacturing operations underwent several changes. For marketers the question was, how extensively and how rapidly should they apply the techniques of bulk distribution developed in earlier years?

DRIFTING TOWARD PRODUCTION OF NATURAL GAS AND CRUDE OIL

The first steps toward the addition of production to the integrated business of the Standard Oil Trust were taken gradually. They came not as the consequence of a clean-cut decision but through a series of circumstances and in a succession of minor moves.

In 1882 the Standard Oil group owned only four small producing properties acquired in the 1870's. The Galena Farm Oil Company, Limited, and the George P. Smith Farm, both near Franklin, Pennsylvania, supplied heavy oil for the manufacture of lubricants by the Galena Oil Works, Limited, and the Signal Oil Works, Limited, in which the Trust held shares. Standard Oil men drilling on the leases of the Germania Mining Company in Potter County, Pennsylvania, hit nothing but dry holes, and the corporation was liquidated in 1883. The Producers' Consolidated Land & Petroleum Company, the largest of the four holdings, was little more successful. In 1877 the Standard Oil group had purchased 65 per cent of the shares in this company after having bought its pipeline properties in McKean County, Pennsylvania, and its refinery at Bayonne. The task of Joseph Bushnell, the president of the corporation during the

years under review, was primarily to handle the properties in the most economical manner while the volume of production declined.[1]

Although the Trustees authorized no expansion of producing activities for some years, several prominent executives of the combination through personal investments were fully aware of production's absorbing attractions. The rule adopted by Ohio Standard in October, 1878, which declared that "dealing in crude oil and the ownership of producing interests" by the company's employees was "contrary to a sound business policy and likely to lead to unsatisfactory results," was not adopted by all Standard Oil units and, for Ohio Standard, was either not strictly enforced or not intended to apply to top managers. John D. Archbold, one of its directors, was both a stockholder and director of the Anchor Oil Company, organized in 1882.[2] Men in other parts of the Standard Oil combination were even more active. J. J. Vandergrift had a variety of investments in producing companies, and individuals on the lower echelons, especially pipeline men, sought by drilling ventures both to increase their incomes and to keep in close touch with producers.

In 1884 the Standard Oil executives discussed the advisability of buying shares in a production company. The issue arose when they were asked to subscribe for stock in a new corporation as part of the plan for a shut-down movement in 1884, which proved abortive. The most prominent producers wanted to work together in order to attempt to control production, to improve prices, to eliminate competition between themselves in acquiring prospective oil territory, and to save on the expense of drilling wells on the boundary of leases merely to protect claims. Vandergrift and O'Day urged Standard Oil to participate in the projected company because this would assure getting the oil for the combination's pipelines and would forward "cordial relations" with the producers. Archbold, who was not opposed to Standard Oil's going into production, feared that this particular move would be unwise. He argued that "it would make new food for demagogues, politicians, papers, and howlers of all descriptions," and "for an outcry to the effect that the Standard was joining with large producers to crush out the small ones, and all that sort of thing." Furthermore, he doubted whether the company would be either "a very harmonious or profitable one," and preferred, if necessary, to help the producers by making loans to them.[3] Other members of the Executive Committee also opposed the combination's buying shares, but they did not object to having individuals in Standard Oil hold an interest. Therefore, when the Associated Producers' Oil Company was organized with a

capital of $1,000,000, Daniel O'Day and J. J. Vandergrift participated with H. L. Taylor, John Satterfield, John L. McKinney, Henry Fisher, E. O. Emerson, and others. Since O'Day's subscription for $25,000 was bought and held for some years by the Producers' Consolidated Land & Petroleum Company, the relation to the Trust was only one link removed.

In 1885 the Standard Oil Trust made another move toward becoming interested in production. It acquired partial ownership of the West Virginia Oil Company, thus becoming a holder of additional producing property. The firm drilled no wells but owned land rich in natural lubricating oil, received royalties, arranged for the sale of its own crude and that of lessees, and pumped it to a refining plant at Parkersburg. Participation in the ownership of this new company came from a desire on the part of Standard Oil men to thwart an attempt by some officials of the Baltimore & Ohio Railroad Company to acquire producing property in Ritchie County, West Virginia, and thereby to supply their own company with kerosene and lubricants. On winning out on the competitive bid for the lands of the West Virginia Oil & Oil Land Company, the Standard Oil men, not to antagonize the railroad executives, worked out a compromise with them and with an experienced production man, C. H. Shattuck. The latter ran the jointly owned new company as though it was his own private business, calling no more than three directors' meetings between 1885 and 1906.[4] He supplied the railroad with the variety of oils it needed, when the Galena Oil Works, Limited, did not wrest a sale from him. Again, in a particular case, the executives of Standard Oil had made a decision which gave them revenue from the production of oil.

Another step taken in the mid-1880's was much more significant in moving the combination into the producing business. The National Transit Company began, through a series of affiliates, to participate actively in producing and transporting natural gas.

Many slow pioneering steps in the natural gas business had been made prior to this decade. Dating its use in Fredonia, New York, back to 1824, natural gas had previously served several local markets. By the 1870's it was being piped short distances to a few domestic and industrial consumers in Oil City, Titusville, and Pittsburgh. Over the years techniques for storing, transporting, and burning gas had been improved. In fact, in the course of the development of artificial gas manufactured from coal and gas oil[5] businessmen and engineers had supplied a partly free ride technologically for the natural gas men. The market for the fuel was

already prepared, and large industrial users were particularly susceptible to offers of natural gas if the price was lower than that of other fuel.

In the 1880's expansion in the use of natural gas proceeded at an accelerated rate. J. N. Pew and E. O. Emerson of Pew & Emerson Company, Limited, completed a pipeline to Pittsburgh in 1883 and demonstrated the commercial feasibility of supplying gas on a large scale to mills and factories. The opening of new oil fields in Pennsylvania and West Virginia increased the available supplies of natural gas. On May 29, 1885, the Pennsylvania legislature made its political climate much more conducive to the growth of the industry by authorizing the incorporation of natural gas companies and conferring upon them the right of eminent domain, subject only to such regulations as the councils of cities and towns might adopt by ordinance. The next few years witnessed a natural gas boom. The process of combining and merging began before Standard Oil entered the business.[6]

The decision of Standard Oil to go into the natural gas business is an excellent example of a move being initiated on the lower rungs of the managerial ladder. The pipeline men were enthusiastic about taking part in the natural gas business and urged action on top management. O'Day wrote many letters on the subject directly to John D. Rockefeller, and he was soon assisted in his reaching out for new opportunities in the field by his able lieutenants, William T. Scheide, the veteran pipeline expert, and C. N. Payne, who was brought into the organization to help with the new natural gas ventures.[7]

Several circumstances attracted the pipeline men to the natural gas industry. Close to production in the Oil Regions, they saw the excellent opportunities for profit in this business. Some of them were already experienced in its operations through their own personal investments: J. J. Vandergrift with John Pitcairn, Jr., financed the Natural Gas Company, Limited, which from 1875 supplied gas to the iron mill of Spang, Chalfant & Company, at Etna, near Pittsburgh. Only a small part of the natural gas produced in the Bradford oil field was utilized as power for drilling and pumping wells, and pipeline men disliked to see the waste of a raw material, especially when they could easily transport it. O'Day expressed another motive when he argued to the president of the Trust that for an investment of $100,000 the pipeline interest could construct equipment to pipe natural gas for its own use at pumping stations in the Oil Regions; fuel was costing that amount per year. Some of Standard Oil's refineries were burning natural gas under their boilers, and contracts with suppliers

were for unsatisfactorily short periods. Why not let the allied group deliver the fuel? Standard Oil pipeline men, full of pride in their amazing accomplishments in construction to date and sure of their practical skills, felt confident that they could transport the explosive, inflammable material with its uncertain pressures at least as efficiently as any others.

Once launched on piping gas, National Transit executives became eager to serve promising markets at greater distances from the developed gas wells. They asked for permission to prospect for neighboring gas lands, obtain leases, and become producers in order to save the expense of constructing tedious lines and struggling over their long length with many maintenance problems.[8]

Top management approved going into the natural gas industry but depended on the men in the field both to carry out plans and to make suggestions for new steps. After long discussions throughout 1883, the Executive Committee gave the pipeline men the green light. Rockefeller, admitting his lack of knowledge of this function, wrote nothing but general advice, such as "We should keep this gas question in mind and not be behind. We may make a mistake in going too fast." He later wrote to O'Day reassuringly, "I am desirous to have our National Transit Company pursue the gas business earnestly," and also declared: "I am willing to back you up as long as we have any money left, and it is because you very carefully and intelligently consider before [making] such recommendations."[9] The pipeline companies could and did finance the new ventures.

No sooner had the Executive Committee given the signal for action than the pipeline men made recommendations for new moves and carried them effectively into operation. Within three years after 1883 National Transit had bought into some companies and organized a number of others, often with strong local minority interests. (See Table 16.) By August, 1884, O'Day already could report rapid progress in pipeline construction in the Oil Regions. A gas line to Olean supplied both Acme Oil Company and Eclipse Lubricating Oil Company, Limited, of the Trust with cheap fuel and made them independent of coal. Several other manufacturers and local retailers of gas signed contracts with affiliates of National Transit. Within another year that company's investment in gas properties was a million dollars, and O'Day, full of ideas for serving other cities, proposed that all Standard Oil men should be instructed to be on the lookout for gas-producing properties. C. N. Payne, who had built the long natural gas line from McKean County to Buffalo, was made

Table 16 NATURAL GAS COMPANIES AFFILIATED WITH NATIONAL TRANSIT COMPANY, 1886

Company	*Date Acquired or Organized*	*Percentage of Stock Held*	*Function*
Buffalo Natural Gas Fuel Company, The	1886	68	Marketing in Buffalo
Lawrence Natural Gas Company	1886	75	Producing and piping in Pennsylvania
Mahoning Gas Fuel Company, The	1886	75	Piping from Pennsylvania and marketing in Youngstown, Ohio, and along route
North Western Ohio Natural Gas Company	1886	70	Producing, piping, and marketing in Toledo and vicinity
Northwestern Pennsylvania Natural Gas Company	1886	100	[a]
Oil City Fuel Supply Company, The	1885[b]	100	Piping and marketing in Oil City
Pennsylvania Gas Company	1885[b]	[a]	Piping and marketing in Warren, Pennsylvania, and neighboring towns
Salamanca Gas Company	1886	100	Marketing in Salamanca
United Natural Gas Company	1886	100	Producing and piping from McKean County, Pennsylvania, to Buffalo

[a] Incomplete information.
[b] Organized by individuals outside Standard Oil and purchased by National Transit.
Source: SONJ, morgued charters and corporate records; Consol. Accts. of S. O. Trust, 1885-1891; W. F. Taylor, "History of the Standard Oil Company," 353-370.

general manager of National Transit in 1888. In that year the corporation's investment in the gas industry had mushroomed to more than seven million dollars, and the National Transit Company, through its several affiliates, was producing some gas, owned a few local marketing companies, and had laid many miles of pipeline to carry gas to towns and cities in Pennsylvania, New York, and eastern Ohio.[10]

In 1886 most of National Transit Company's affiliates in the gas business were brought together in the Natural Gas Trust. Its trustees (Joseph D. Potts, John D. Archbold, H. M. Flagler, Benjamin Brewster, H. H. Rogers, Daniel O'Day, and William T. Scheide) issued certificates to National Transit for all outstanding shares in four companies and for

its holdings in two others. The Natural Gas Trust constituted the largest part of the National Transit Company's gas investment in 1888, when its holdings were:[11]

Natural Gas Trust certificates	$3,606,500
North Western Ohio Natural Gas Company stock	2,631,200
Lawrence Natural Gas Company and The Mahoning Gas Fuel Company stock	1,125,000
	$7,362,700

Before the end of the 1880's, however, men within the Standard Oil Trust were doubtful of the advisability of its connection with the gas business, especially with the Natural Gas Trust. As early as 1886, W. P. Thompson was concerned at public criticism—at the accusation that the Standard Oil group was attempting to monopolize the business by injuring old concerns, forcing fights, and then combining with opponents to raise the price of gas. Although the executives considered the opinion unfair, they found it a disquieting judgment. More important, S. C. T. Dodd questioned the legality of National Transit's holding the stock of the Natural Gas Trust. As a result of the lawyer's urging, in 1888 Brewster recommended the sale of certificates directly to the Oil Trust.

The Executive Committee approved Brewster's advice. The transfer was made, and then the certificates were distributed as a special dividend pro rata to the stockholders of the Standard Oil Trust. Although the National Transit Company had divested itself of its Natural Gas Trust certificates, they had passed merely from the right hand into the left: the same individuals as owners continued to be interested in the investment, and the Gas Trust and National Transit had several officers in common. The National Transit's remaining holdings of stock in gas corporations were limited to two small firms—the Lawrence Natural Gas Company and The Mahoning Gas Fuel Company—and to about three-fifths of the stock of the North Western Ohio Natural Gas Company.[12]

Although National Transit men had directed most of their efforts to piping and marketing gas, they had also gained some experience in producing. They had bought some wells and drilled others. In their search for gas they had hit some oil. Furthermore, the ventures into the gas business had made the Executive Committee keenly aware of the profits to be made in mining a raw material.

In spite of all the foregoing developments, the total production of crude oil from Standard Oil properties remained very small in 1888. In

that year John D. Rockefeller testified that the yield from all producing companies in the combination was about two hundred barrels of crude oil per day. The average daily production for the United States in that year was 75,649 barrels.[13] However, Rockefeller and his associates were already making plans for an expansion of their participation in this function, in part because of their involvement in Lima oil and in part because of the situation in the Appalachian region.

STANDARD OIL BECOMES A LARGE PRODUCER

One of the greatest single threats to the security and longevity of the combination was the lack of assurance of regular supplies of the basic raw material, crude oil. Fear of exhaustion of petroleum reserves was a normal worry in the petroleum business. Likewise of concern was the fact that in the late 1880's a group of Appalachian producers, dissatisfied with the current prices for their crude, combined to criticize and combat Standard Oil. Pipeline men within the combination were disturbed both at this attitude and at the growth of competition in their own function. Control of pipelines and maintenance of runs at full capacity were not easily achieved, especially as old fields declined and new fields were opened. Even if Standard Oil's position in pipeline transportation remained strong, some officials doubted that this alone would guarantee an adequate supply of crude oil for the refineries.

A review of some of the diverse and changing opinions expressed by Standard Oil executives during the years 1884 to 1888 concerning the policy to pursue in buying Appalachian crude oil, and the actions which followed, throws some light on their motivation for deciding to go into producing petroleum themselves. The opinions were influenced in part by the marked change in the production of crude oil—the fluctuation in production in the Appalachian region and the growth of the Lima-Indiana field. Among other facts affecting the situation were the relations between the producers and Standard Oil and the growing strength of speculators in oil certificates.

In the eighties Standard Oil depended on purchasing most of its crude oil in a manner discussed in detail in Chapter 4.[14] National Transit acted as the transporter and warehouser or banker for the crude oil run into its system. It acknowledged the receipt of petroleum by certificates. These were sold by producers, usually on the oil exchanges. There Standard Oil's Seep Purchasing Agency, other buyers for refiners, and speculators purchased the certificates. New York Standard's Crude Stock Depart-

ment, under orders from the Executive Committee, directed Seep's operations, co-ordinated them with those of other brokers buying for the combination, and carried Standard Oil's reserves on its books. Standard Oil's own refineries and some outsiders purchased certificates from the Crude Stock Department and got deliveries of crude oil from the pipelines.

During 1884 and 1885 the members of the Executive Committee debated the extent to which the combination should build up its ownership of oil certificates. Even though Standard Oil owned a large reserve supply of oil for its refineries, when prices were low Rockefeller frequently expressed a desire to buy certificates in excess of current consumption of crude oil. He defended his position by arguing that surplus funds earning a low rate of interest should be put to work at this possibly profitable purpose; they might also help to steady a declining market. In the course of the discussion refiners pointed out that the best interests of Standard Oil were not served by falling prices of crude. Low prices antagonized producers, discouraged exploratory drilling, and endangered future supplies. Furthermore, large buyers of refinery products, who constituted the chief market for Standard Oil at this time, postponed purchases when crude oil prices were falling because these prices were a barometer of future quotations for the commodities manufactured from crude petroleum. In addition, Standard Oil, as a large owner of crude oil, was concerned at maintaining its value. When in 1885 Flagler objected to the growing "long account" in crude ("I don't believe I was cut out for a big operator," he wrote), Rockefeller countered with the argument that a large manufacturer must buy crude oil on a large scale.[15]

Reports from the Oil Regions appeared to favor a policy of buying crude oil. Brewster pointed out that the consumption of Pennsylvania crude was exceeding its production in 1885. A study by Standard Oil's Samuel Comfort of the petroleum reserves in Pennsylvania included the gloomy prediction that finding anything like the productive Bradford field again was unlikely, a conclusion strongly supported by J. P. Lesley, State Geologist of Pennsylvania, and others.[16]

Yet, in 1885, Charles Pratt continued to express most forcefully the view of the conservative refiner. He was in favor of Standard Oil's owning a liberal stock of crude oil and increasing it modestly during an upward movement in price, but he argued that normally Standard Oil should maintain a steady reserve of crude and should purchase only enough daily to cover sales by the Crude Stock Department to refiners. "Our business is that of manufacturers," he wrote to Rockefeller, "and it is in my

judgment, an unfortunate thing for any manufacturer or merchant to allow his mind to have the care and friction which attends speculative ventures."[17]

Apparently through the latter part of 1885 and the following year Standard Oil followed the policy of holding its sizable reserve of certificates and then buying to cover current consumption of crude oil. In June, 1885, the Executive Committee was ordering certificates purchased each day to match sales of crude petroleum made by the Crude Stock Department on the previous day to refineries, including those of the combination. The next year the practice was modified by a unanimous agreement of the Executive Committee to sell certificates each day "to an extent equal to the previous day's purchases at the front"— at the wells.[18]

In 1887 and the two following years Standard Oil executives adjusted their policies to meet both a short-run situation and their long-time needs. They attempted to satisfy disaffected producers by reducing charges for storage and by aiding in a program to curtail production, while at the same time they started to give more serious consideration to the entrance into production on a large scale by the combination itself.

The producers, suffering from reduced margins of profit, organized and made demands on Standard Oil. As previously noted, during the period of low prices of crude in 1884 the producers had planned a shutdown which proved unsuccessful. In 1887 they came together again to discuss their current situation. Although consumption of Appalachian petroleum had exceeded its production for two years, the price of crude had fallen. The large stock of Lima oil, added to the stored stocks of Pennsylvania crude, hung over the market, and speculators in oil certificates also took cognizance of rising production abroad. At the same time, costs of drilling had risen in the southwestern Pennsylvania counties, more wells in the old fields went on the pump, and more boreholes proved to be dry. Appalachian producers were nostalgic for the recent halcyon days of flush production in the Bradford field. They blamed the Standard Oil Trust for their troubles, claiming that it charged too high rates for storage and set the price of crude oil too low. Little consideration was given to the fact that some difficulties were traceable in part to the producers' own unscientific accounting, that large stocks had accumulated because of their own unrestrained competition, and that prices were set on the exchanges which Standard Oil did not dominate.[19]

Standard Oil's first attempts to meet the producers' demands merely led to fresh requests. The pressure of producers in 1886 had induced

National Transit to reduce storage rates from fifty to forty cents per thousand barrels per day. Within a few months, through the Billingsley Bill in the Pennsylvania legislature, the producers sought to make pipelines common carriers and to force sharp reductions in pipeline tariffs, violators to be subject to severe punishment.[20] Before the defeat of that measure on April 28, 1887, National Transit responded to a demand for reduced rates from a committee of producers, headed by the aggressive Colonel John J. Carter, by cutting storage charges in the Appalachian region to twenty-five cents per day per thousand barrels and reducing the deduction for sediment and evaporation from 3 to 2 per cent.[21] Still dissatisfied, in June an overwhelming majority of Appalachian producers completed a plan to combat Standard Oil through a new organization called the Producers' Protective Association.

Within four months, however, the Producers' Protective Association had changed from a policy of belligerence toward Standard Oil to one of co-operating with it. In a preliminary conference with John D. Archbold and Benjamin Brewster, the Executive Committee of the Association admitted that the chief reason for the fall in price of Pennsylvania crude to sixty-two cents per barrel was the earlier excessive production and the large accumulation in storage. To assure orderly reduction of those stocks, on November 1, 1887, the Association and New York Standard, which bought and held crude for the combination, signed an agreement. Upon the guarantee that the Association would bring about a curtailment of 17,500 barrels daily in the production of Pennsylvania-grade oil, Standard Oil agreed to hold six million barrels of its own oil for at least a year. At the end of that period the oil was to be sold, and Standard Oil was to distribute the profits above the price of sixty-two cents per barrel to producers, their employees, drilling contractors, and their employees thrown out of work by the curtailment program. Total stored stocks went down gradually, as the signers of the agreement had planned. (See Table 17.) The last of the six million barrels was sold only in the spring of 1889. Profits on sales were generally satisfactory to the beneficiaries.[22] Although privately administered, the curtailment scheme by the oilmen of 1887-1889 followed principles similar to those later incorporated by the federal government into the Agricultural Adjustment Act in the 1930's.

The Standard Oil men had several reasons for aiding the producers. As indicated above, a discouraging low price for crude oil was certainly not to Standard Oil's "general interest." Furthermore, the outcome of experiments with Lima crude was still uncertain, and, in order to activate

searching and drilling in the long run, it was necessary to encourage Appalachian producers by immediately higher prices, even if coupled with reduced output in the short run. Archbold later testified that the Executive Committee, thinking that the producers were entitled to a "reasonable price" for crude oil, had aided the curtailment program "for the purpose of accomplishing a harmonious feeling" between the Trust and the producers.[23]

Table 17 ANNUAL PIPELINE STATISTICS OF PENNSYLVANIA-GRADE CRUDE OIL, 1885-1892

In barrels of 42 gallons

Year	*Runs*	*Deliveries*	*Stocks at End of Year*
1885	21,678,357	23,725,489	33,539,038
1886	25,843,048	26,295,440	33,367,898
1887	21,846,146	26,491,588	28,357,112
1888	16,290,143	25,996,802	18,604,474
1889	21,576,791	29,325,396	10,904,793
1890	29,130,756	30,638,740	9,295,514
1891	34,896,556	29,120,765	15,343,233
1892	32,761,559	30,502,120	17,395,389

Source: Derrick's *Handbook,* I, 809-810.

Perhaps an even broader purpose carried some weight in the counsel of the Standard Oil men. In May, 1887, Warden had written a long, thoughtful letter to Rockefeller on the public relations of Standard Oil. Although the Trustees had met with "unparalleled success in commercial history," he declared, they had a "public character not to be envied"; Warden suggested a broad program of profit-sharing with both employees and producers to "change the whole current of opinion."[24] An agreement to give to producers profits resulting from an improvement in the value of six million barrels of crude oil owned by Standard Oil was at least a gesture in the direction indicated.

Whatever the motives, the effect on the relationship with producers was salutary. Even after an early meeting, Scheide informed 26 Broadway of a marked change in the attitude of the men in the field: "Some of the most virulent have taken pains to advertise the complete flop that has occurred in their feelings." They referred to Standard Oil's "magnanimity." Archbold reported to Rockefeller that conferences were conducted with "entire good humor." The producers, he wrote in 1889, "think we have met our obligations very fairly. They think that we have made friends of all fairly disposed people in the Oil Regions in connection with the trans-

action throughout."[25] A leading producer commented that it had "taught the producer the possibility of friendly co-operation between himself and the Standard Oil Company, a proposition that two years ago would have been considered only a figment of a disordered mind."[26]

While Standard Oil was attempting to improve crude oil prices by co-operating in the short-term policy of curtailment, its own refiners soon became concerned at the combination's own reduced stocks and increasingly aware of the desirability of assuring an adequate supply of Pennsylvania-grade crude oil in the long run. Although following the agreement in November, 1887, Standard Oil bought all oil offered "at the front" and reserved six million barrels for the profits of producers, it did not itself own as large a stock of Pennsylvania crude as in earlier years. By 1888 Charles Pratt got on the "anxious seat" and was reported by Archbold as "quite radical on the subject" of purchasing more heavily.[27]

Pratt considered Standard Oil's position critical and recommended buying crude oil considerably in excess of current use. He supported his marked change of view from that expounded in 1885 by pointing out that Standard Oil's own stocks of crude were low, that Appalachian production had declined and did not meet its total current consumption (see Table 17), that lowered storage charges encouraged the holding of petroleum by producers, and that little "real" oil, as compared with certificates, was offered for sale. He contended that Pennsylvania producers should be stimulated in every possible way, that pipelines must be fully employed carrying oil, and that more good Pennsylvania oil should be converted into high-quality products to make possible reduced prices on export oil to meet competitors. He felt that Standard Oil's position had been weakened, both because the producers were united as never before and because speculators in crude oil were more powerful now that the number of operators capable of cornering the market had grown. Standard Oil's refiners needed crude oil reserves to cover six months' needs in order to be able to keep out of the market that long. Now the cautious Pratt was willing to have Standard Oil men risk a "small loss" on Pennsylvania crude if its production should increase, in order to safeguard their position if it did not do so. In a long Executive Committee meeting he wrote a vehement memorandum summing up his views: "*What we want is a safe position* and we want a large, very large production. . . . I am not sure but we want $3 oil."[28] While not opposing Standard Oil's current developments in Ohio, he had less faith than Rockefeller in the early solution of problems there. He was arguing for the purchase of a

large volume of crude, not for going into production, but his reasoning illustrated the refiners' anxiety over the supply of their raw material.

Meanwhile, others were advancing arguments for Standard Oil's entering into production of crude oil on a large scale. The almost chronic disaffection of producers had made some Standard Oil men eager to be "better informed as to the cost of producing oil";[29] only active participation would give them the desired information. Bostwick, concerned at the decline of the old fields, strongly recommended the new departure for a weightier reason. In a letter to the Executive Committee in 1886 he reiterated the need for abundant production; and, since only Standard Oil men had the financial strength, he asked, to use his own words, "Should we not in a systematic and comprehensive way expend what is necessary to prospect for, and open up, if possible, new fields?" He proposed an annual expenditure of $500,000 for this purpose, declaring: "Now are we satisfied to keep our eyes closed to our true interests, or shall we take the lead in perpetuating the business?"[30]

More than any other group, the pipeline men, who had only recently led Standard Oil into production of natural gas, urged that the combination purchase producing properties. In the late eighties not only were the total runs reduced but National Transit lost business to others; O'Day and Scheide were "galled" at the success of a "perfect flood of new competitive lines." The pipeline men were eager to have a capacity load for their equipment, which ownership of producing properties would assure them. Also, as O'Day wrote to Rockefeller: "You know I have been persistent for a long time in advising the company to purchase producing property, and from time to time cited cases in which I am personally interested to show that the business of itself was a good one." Scheide declared "that both as an investment and as a protection to its general interests" the company could not spend money more "fruitfully" than in production.[31]

No evidence indicates the relative weight given to these arguments, but they show the eagerness on the part of several Standard Oil men to get into production. A desire to be an important element in the new Lima-Indiana field also played a role in causing Standard Oil executives to reverse their policy of depending almost entirely on purchasing crude oil from outside producers.

When Standard Oil changed its policy early in 1888, it proceeded cautiously in order not to antagonize other producers. A letter of Scheide to Rockefeller in May reflects the attitude of the company: "I feel curious

to know how it [the new policy of Standard Oil's becoming a large producer] will be taken there [in the Appalachian regions] as, while the actions of the Penna. producers have not been remarkable for consistency, I think some of them will blush if they have to abuse us now for doing what they have as long damned us for not doing." Scheide assured Rockefeller that every care was being taken not to interfere "with any man's rights" and to choose lease men so "that nothing they may say or do will ever cast any discredit on the company."[32]

Although Standard Oil had made some purchases of oil leases at least by the spring of 1888, it only assumed its role as a large-scale producer the following year. As in the gas business, the pipeline men provided contacts with the field work, and the National Transit provided most of the funds. In January, 1889, through J. J. Vandergrift, the trustees purchased about a fourth interest in the Washington Oil Company. Meanwhile, various executives of the National Transit Company bought up both active and potential producing leases, which were vested in two new corporations wholly owned by Standard Oil interests—the North Penn Oil Company and the South Penn Oil Company.[33]

National Transit funds also provided capital in June, 1889, for buying a majority interest in a two-year-old corporation, The Ohio Oil Company. This company's capital was increased immediately to $3,500,000, and, under the presidency of William Fleming, it took over Lima-Indiana oil properties already acquired by him as head of the Natural Gas Leasehold Department of North Western Ohio Natural Gas. By the end of 1890, when the capital of The Ohio Oil Company was raised to $8,000,000, it was the largest producer in the Lima-Indiana field.[34]

During the years 1890 and 1891 Standard Oil expanded its producing activities vigorously. Either through individual executives, or National Transit, or directly, the Trust bought all the outstanding shares of several operating companies—the Union Oil Company, the Anchor Oil Company, the Forest Oil Company, and the Midland Oil Company. In some of these Vandergrift, O'Day, Archbold, and others had earlier been large shareholders. Standard Oil executives also organized the Jackson Oil Company in Ohio, capitalized at $100,000, and participated to the extent of 50 per cent in the new million-dollar Marion Oil Company in Pennsylvania.[35] By the end of 1891 the Standard Oil combination had more than $22,000,000 invested in producing companies. (See Table 18.)

The purchasing of operating companies offered several advantages. Standard Oil acquired some developed oil and gas properties in New

Table 18 NET VALUE OF STANDARD OIL PRODUCING PROPERTIES DECEMBER 31, 1891

Producing Companies	*Percentage Held by S. O. Trust*	*Net Value*[a] *of S. O. Trust Percentage*
New Properties		
Forest Oil Company	100	$5,627,253
Jackson Oil Company	100	82,030
Marion Oil Company	50	268,901
Midland Oil Company	100	1,156,107
North Penn Oil Company	100	1,894,321
Ohio Oil Company, The	100	7,820,217
South Penn Oil Company	100	2,153,138
Union Oil Company	100	2,799,615
Washington Oil Company	71	621,750
Old Properties		
Galena Farm Oil Company, Ltd., The (in liquidation)	77	1,406
Producers' Consolidated Land & Petroleum Company	65	194,645
Smith Farm (owned by Acme Oil Company, Pennsylvania)	100	[b]
		$22,619,383

[a] Net value in Standard Oil accounts was net assets or net worth.
[b] No information.
Source: SONJ, Consol. Accts. of S. O. Trust, 1891.

York, Pennsylvania, West Virginia, Kentucky, Ohio, and Indiana. Some of the most valuable lands and the leading men were separated from the current movement to organize a co-operative producers' company in opposition to Standard Oil, activities which reached fruition in the Producers' Oil Company, Limited, in January, 1891. Capable executives were acquired to direct the producing activities of the Trust. Although Thomas W. Phillips became a holder of Trust certificates, he refused all offers to join the combination as an executive; a number of other producers of the first rank accepted the invitation, however. Among those added to Standard Oil's staff were W. J. Young, J. J. Vandergrift's right-hand man; John Worthington, one of the best practical oilmen in the United States; C. F. Lufkin, experienced in both piping and producing petroleum; J. L. and J. C. McKinney, brothers famed for their integrity and success in business throughout the Oil Regions; and Noah F. Clark, who became one of the most aggressive producers in the organization. Also, as a result of Vandergrift's belief in employing scientists, Israel Charles White, whose

popularization of the anticlinal theory of oil deposits had made him a leading geologist of his time, was already advising the Forest Oil Company.[36]

Under vigorous leadership the Standard Oil producing companies immediately expanded their operations. New leases were acquired, new wells drilled. At times 26 Broadway felt the need for putting a slight damper on such enthusiastic operators. "It looks to us as though the natural disposition of the producers to drill has measurable possession of our own men,"[37] Archbold exclaimed to Rockefeller in July, 1890. Standard Oil itself was now infected with drill fever.

New emphasis on production of crude oil created new problems and demanded suitable administrative machinery. A Production Committee was set up and reported directly to Archbold. The individualistic producing men who were added to the Standard Oil family at first found it difficult "to run in harness." They competed with each other to get territory. Fleming of The Ohio Oil Company had to be reminded to follow recommendations to buy leases for "the general interest," even when he was discouraged at the price paid for Ohio crude. O'Day, one of the first members of the new committee, reported that the quick-acting Clark had the idea of running his company "largely on his own judgment," and, the veteran pipeline man then added, the members of "the Committee seem willing that he should have all the latitude necessary but that where things can be referred to them so that he can have their judgment as well as his own they should be referred." By 1890, however, the administration of Standard Oil's producing companies was being systematized. An exchange of properties between the corporations facilitated geographic concentration of properties. In Archbold's opinion the adjustments among these companies representing "a vast acreage and enormous extent of business" were accomplished "admirably." The Production Committee was "getting into good working shape." The top executives of Standard Oil were pleased with the accomplishments of their "new partners."[38]

Upon returning from an inspection tour of South Penn's producing properties in West Virginia the following summer, Archbold described enthusiastically and in detail this part of the operations. N. F. Clark was "possessed" with his business and had attracted an able group of men, many of whom were "scarcely less zealous and energetic than himself." The company held 700,000 acres of leases and a "great deal of property in fee." Although its leader had pioneered new territory, of forty-two

wells drilled thirty-eight were producers. The experienced producer, John L. Satterfield, who accompanied Archbold on the trip, described the undertaking as "the ablest, most important and most successful operation in the oil producing line that the business has ever known."[39] Standard Oil was definitely launched here, as in other areas, as a successful, aggressive, large-scale operator.

The fruits of such labors were shown in the statistics of production. The Standard Oil Trust had assumed a leading position among petroleum producers in the United States. In the years 1890 and 1891 the net production of crude oil by the combination approximated 25 per cent of the total for the United States. Although the companies of the Trust, as a unit, constituted the largest single producer in the Appalachian region, its percentage there amounted to only 8.7 of the total for 1890 and 13.7 in 1891. Standard Oil's sizable proportion of the national total of production was accounted for largely by the fact that The Ohio Oil Company extracted more than 50 per cent of the total in the Lima-Indiana field.

However, these net figures understate the combination's relative position. The royalty oil deducted to obtain net figures was also produced by the Standard Oil companies. Assuming that the average royalty paid by Standard Oil producers was one-eighth of that extracted, the gross production of the organization in 1890 totaled 12,593,376 barrels, or 27.4 per cent of the aggregate produced in the United States, and amounted to 50.4 per cent of the crude actually consumed by Standard Oil refineries in that year.[40] (See Tables 19 and 20.) The Trust had added an important function to its activities and had absorbed a staff of leaders who were to play a significant role throughout all the years to 1911.

In the meantime pipeline men had been building facilities in new areas to handle the crude extracted by both Standard Oil and other producers. The development of West Virginia and southwestern Pennsylvania oil fields called for new pipeline systems and storage tanks. In 1885 the National Transit began erecting facilities which later became the South-West Pennsylvania Pipe Lines. When the McDonald field mushroomed from 3,600 barrels daily in the middle of 1891 to its peak of 83,000 barrels daily during the first week of November, the Standard Oil company threw up tankage so speedily that almost no oil went to waste. Rapid increase in production in West Virginia in the late eighties and the entry of the South Penn Oil Company into that field induced the Executive Committee to authorize the organization of The Eureka Pipe Line Company, which collected almost all the oil in West Virginia by 1892 and delivered it

Table 19 ANNUAL NET PRODUCTION OF CRUDE PETROLEUM BY STANDARD OIL INTERESTS COMPARED WITH THE TOTAL PRODUCTION OF THE LIMA-INDIANA FIELD, THE APPALACHIAN REGION, AND THE UNITED STATES, 1889-1891

In barrels of 42 gallons

	1889	*1890*	*1891*
Lima-Indiana Field			
Ohio Oil Company, The[a]	5,057,700	8,400,568	9,319,156
Total	12,186,564	15,078,378	17,452,612
S. O. Percentage	41.51	55.71	53.39
Appalachian Region			
S. O. Interests	531,906	2,618,637	4,913,775
Total	22,349,825	30,067,307	35,839,777
S. O. Percentage	2.38	8.71	13.71
United States			
S. O. Interests	5,589,606	11,019,205	14,232,931
Total	35,163,513	45,823,572	54,292,655
S. O. Percentage	15.89	24.05	26.22

[a] The small production of the Jackson Oil Co. is included in The Ohio Oil Co. data.
Source: *Mineral Resources, 1898*, 73; *U. S.* v. *SONJ*, XIX, Defendant's Exhibits, No. 266; SONJ, collection of predissolution data. See explanation of net production in Note 40 of this chapter.

either at the Ohio River or at the Pennsylvania border. There the line of the Eureka connected with the South-West Pennsylvania lines and with a new trunk line of the Southern Pipe Line Company, which was completed to Millway in 1891. The additions brought the total of Standard Oil's trunk lines, including those mentioned in the Lima-Indiana field,

Table 20 ANNUAL CONSUMPTION OF CRUDE OIL BY STANDARD OIL REFINERIES, 1885-1890

In barrels of 42 gallons

	Types of Crude Oil		
	Pennsylvania	*Lima-Indiana*	*Total*
1885	17,435,942		17,435,942
1886	19,069,371		19,069,371
1887	19,189,965	647,566	19,837,531
1888	18,504,208	1,101,037	19,605,245
1889	21,339,293	1,625,406	22,964,699
1890	23,361,547	1,621,106	24,982,653

Source: SONJ, Consol. Accts. of S.O. Trust, 1885-1890; *U.S.* v. *SONJ*, XIX, Defendant's Exhibits Nos. 267 and 268. During the years 1885-1890, inclusive, Standard Oil refineries bought 137,153,056 barrels of crude oil but sold a total of 13,257,614 barrels to outsiders. Other Standard Oil units made still other sales of crude to outsiders. The figures for Standard Oil consumption given in *U.S.* v. *SONJ*, XIX, Defendant's Exhibits Nos. 267 and 268, included the crude petroleum actually put through Standard Oil refineries *and* all sales by all units of the combination to outsiders, either for domestic use or for export. Those figures for the years 1885 and 1890 were 17,578,201 barrels and 29,793,042 barrels respectively.

up to about three thousand miles by 1892.[41] The refiners of the combination were assured of a smooth flow of oil to their plants from both old and new producing areas.

KEEPING PACE IN MANUFACTURING

Conquering "sour" crude, entering into production of petroleum on a large scale, and expanding the pipeline system to carry the raw material from new areas to refining centers were only the most obvious and spectacular accomplishments of Standard Oil men in the late 1880's. Equally important to the success of the entire enterprise was the co-ordination of these new developments with established manufacturing and marketing operations of the combination. In the process of maintaining balance among the functions performed, Rockefeller and his associates moved still further along the path to mass production and mass distribution of petroleum products.

Manufacturing operations increased year after year, though the relation of Standard Oil operations to the total for the United States probably altered very little. As indicated in Table 20, total crude petroleum consumed by all Standard Oil refineries rose from 17,435,942 barrels in 1885 to 24,982,653 in 1890—an increase of 43.5 per cent. The volume of kerosene produced rose from 13,009,920 barrels (42 gallons) in 1885 to 17,-233,543 in 1890, and, more significantly, naphtha and gasoline from 1,832,790 barrels to 3,607,619. Charles Pratt, in the only contemporary private estimate now available, calculated that the actual crude used by all Standard Oil refineries accounted for 76.79 per cent of the total consumption of the United States in 1886 and 76.83 the next year.[42] Perhaps that figure was larger after Whiting swung into full operation, but that development had not yet taken place.

A few strategically located plants accounted for much of the increase in throughput. By 1891, the five largest refineries—Indiana Standard's at Whiting, Atlantic's at Philadelphia, Ohio Standard's at Cleveland, Jersey Standard's at Bayonne, and Sone & Fleming's in Brooklyn—ran more than 50 per cent of the crude oil and equivalent handled by all plants of the combination. A comparable development was the almost complete concentration of the Devoe plant on manufacturing and packaging case oil for export.[43]

The increasing concentration of manufacturing activity in a few plants was achieved by new construction, by purchasing several small plants, and by shutting down or dismantling inefficient units, whether recently ac-

quired or previously owned.[44] The refinery at Whiting was all new construction, while the increasing volume of runs at Bayonne was the result of more efficient operations of the existing crude stills and the addition of four new steam stills. The Sone & Fleming plant grew largely by the transfer of equipment from such near-by dismantled works as the Vesta, New York Refining, Greenpoint, and Washington. Between 1887 and 1891 Atlantic Refining added some new equipment but built up its plant in large part by purchasing and utilizing the works of C. T. Place & Company (lubricating oils), Logan, Emery & Weaver, Malcolm Lloyd, the Chester Oil Company (a Tide Water affiliate), and the Globe Refining Company (Pittsburgh). Ohio Standard's growth came through additional building to handle Lima crude, the absorption of two small naphtha plants (Dangler and Forest City) and two lubricating oil works (Frank Rockefeller's Pioneer Oil Company and the Trust's own American Lubricating Oil Company).

Numerous other measures accompanied these developments. Standard Oil shut down one large refinery (Empire Refining Company, Limited, in Brooklyn), dismantled several previously owned and operated works (Portland, Boston, Wheeling, Marietta, and Titusville), purchased and eliminated a number of small works (those of the Knickerbocker Refining Company at Cridersville, Ohio, the Knights of Labor at Olean, New York, Holdship & Irwin in Pittsburgh, and Clark & Warren at Corry, Pennsylvania), and utilized fully the plant purchased by Pennsylvania Standard from the Globe Refining Company in Pittsburgh. Rockefeller and his associates encouraged the merger of Lombard, Ayres & Company with Tide Water interests in 1888 and purchased the Chester Refinery near Philadelphia, as a means of enabling Tide Water to concentrate its crude oil deliveries to the New York area. A year later Archbold and Rogers negotiated with Benson and his associates for the purchase of all Tide Water properties, but the two groups could not agree on the price. Baltimore United purchased the Canton Works from Camden Consolidated as of July 1, 1890, and Jersey Standard took over the Eagle Works two years later, acquisitions of significance in the later operations of the New Jersey corporation.

While supervising these numerous changes in the status of Standard Oil plants, the Manufacturing, Cooperage, Case and Can, and Lubricating Oil committees pursued their daily round of meticulous examination and cogitation upon reducing cost and on means of conforming to the vagaries

of market demands. Only a selection of their activities in connection with refining and auxiliary manufactures can be presented here.

Basing their decisions upon detailed statistical analysis of costs, yields, and sales, members of the Manufacturing and Cooperage committees tackled a host of problems during the years 1886-1891. Not until 1889, for example, did the Manufacturing Committee succeed in adjusting the production of Water White kerosene to an increase in the domestic demand for that article disproportionate to that for Standard White grades. The committee urged several plants to purchase naphtha distillate from outside refiners and process it until, in the early nineties, the higher yield of naphtha from Lima-Indiana crude presented the question of what was to be done with the large supplies of gasoline and related products. Following careful comparison of fuel costs, committeemen persuaded some refineries to switch from coal to crude oil and naphtha tops and then back to coal again. The Manufacturing and Cooperage committees jointly encouraged methods for reducing losses by fire—the substitution of steam heat for stoves in warehouses, brick foundations for storage tanks instead of wood, specific rules for cleanliness and spacing of tanks in storage areas, regulations for loading steamers at wharves—and centralizing barrel preparing and filling in George Hopper's barrel-preparing department. The Cooperage Committee alone activated programs for expansion and further mechanization of barrel factories, for tightening the inspection of staves and barrels, for opening new stave manufacturing plants at Richmond and Newport News, for increasing the weight of hoops, and for constructing a gelatin glue factory at Bayonne. Probably the most modern-sounding suggestion went out from the Manufacturing Committee on August 1, 1889—that in order to reduce evaporation white paint should be used whenever new tanks were completed or old ones repainted.[45]

The record of Standard Oil refiners with regard to improvement in quality of products was mixed. More exact testing of kerosene, naphtha, and lubricants derived from Pennsylvania-grade petroleum did show improvements in quality with regard to color, odor, flash test, viscosity, and the like, but those advances had to be set off against the yet unsatisfactory products from Lima-Indiana crude entering the market in volume in 1891.

Improvements in lubricating oils, a change instituted largely by Standard Oil, probably constituted the outstanding innovation in raising standards of quality among all petroleum products during the late eighties. Until that time the greatest handicaps in making lubricants were inade-

quate knowledge of qualities needed and of the tests therefor. Several men, including G. M. Saybolt and C. M. Perkins of the Standard Oil combination, had developed apparatus for measuring viscosity of oils, but the devices gave no indication as to the resistance of lubricants to heat and friction. The Lubricating Oil Committee aided Professor James E. Denton of the Stevens Institute, Hoboken, New Jersey, in establishing the value of physical tests in relation to correct lubrication. Using the special machinery previously installed at Arvine's request (as discussed in Chapter 4), Denton conducted tests reproducing as nearly as possible normal operating conditions, thereby seeking to determine the qualities desired in lubricants for a wide range of industries, including railroads. He began publishing his conclusions in engineering periodicals in 1888. Standard Oil manufacturers shortly arranged to meet Denton's specifications in all plants. The Bayonne Refinery of Jersey Standard in the summer of 1889 appropriated funds for new equipment with which to press oils to the "New Grade Standards" in order "to successfully compete with the Scotch and other competitors," as Archbold phrased it.[46]

Denton's activities constituted only a small part of the total Standard Oil effort to raise the quality and expand the volume of lubricants and wax. Various plants improved harness oils, wool-scouring stock, soap stock, and other items, as suggested by E. T. Bedford in 1885. The number of products was expanded, partly in response to the request for specific lubricants by consumers. C. M. Everest of the Vacuum Oil Company noted in 1894 that the character of manufactured lubricants had been "materially modified" during the preceding ten years. Some of this change resulted from costly experimentation conducted by Vacuum in conjunction with the actual operation of railroads, almost all of which had chemists to test the quality and performance of lubricants by the late 1880's. Galena's guaranteed-performance contracts were quite attractive to railroads, also. In fact, sales of Galena and Signal oils rose so spectacularly in the period that Archbold decided not to ask Charles Miller, the supersalesman, to exchange his stock for Trust certificates, having "serious doubts as to whether his zeal would be as great if his individual interest" should be given up.

Makers of pressed lubricants showed similar gains. American Lubricating at Cleveland doubled its production and sales between 1886 and 1890. According to Charles C. Burke, president of the Eagle Oil Company, he had been chiefly responsible in the late 1880's for developing and spreading throughout the Standard Oil combination the effective utiliza-

tion of the latest equipment—sweating pans, Gray chillers, and large filter presses—for pressing wax and manufacturing a wider range of lubricants of improved quality. The Eagle Works, under his management, ran 877,479 barrels of crude oil in 1891, the year before the plant was taken over by Jersey Standard, and the yield included 190,417 barrels of lubricants.[47]

Operations at Jersey Standard's Bayonne plant well exemplified the range and character of processing petroleum in a large Eastern refinery of the combination in 1891-1892. At the first distillation six cuts were taken—light naphtha up to .705 on the specific gravity scale, heavy naphtha (.705 to .744), extra-heavy naphtha (.744 to .765), Water White kerosene (.765 to .795), heavy kerosene distillate (.795 to .825), and "slops" (.825 to the point where the oil turned very brown). While still boiling, the residue was pumped into a tank where, upon cooling and further distillation, it became paraffin distillate, tar, and coke. Some of the light naphtha was sold as crude naphtha, some was sold after redistillation by steam, some was fractionated into gasoline (.636 to .675) and naphtha (.675 to .720) only, and some fractionated into cymogene, rhigolene, gasoline, naphtha for lighting and heating, and heavy naphtha used as a substitute for turpentine. Heavy naphtha was often fractionated further into benzine, which was frequently added to the heaviest fraction from the redistillation of light naphtha, and light distillate. Extra-heavy naphtha was usually mixed with the heavy kerosene distillate and refined to produce "export oil" with a flash point of 21° to 24° Celsius (69.8° to 75.2°F.). Water White kerosene distillate, after treating, was sold chiefly in the domestic market. "Slops" became either gas oil or crude equivalent. From the paraffin distillate were derived either crude vaseline, or oils for greases, or several grades of paraffin and six basic categories of lubricating oils, the most famous being Solar Red.[48] Yields varied with the types of crude oil used, and the volume of particular grades of products was shifted in accordance with fluctuations in demand.

Bayonne's managers also made profitable use of almost all other products incidental to refining. The first vapors to distill over—sometimes called noncondensables at the time—were piped to fires under boilers and stills to facilitate combustion. Acid sludge was sold to commercial fertilizer companies, chiefly to The Rasin Fertilizer Company and The Liebig Manufacturing Company, in both of which the Standard Oil Trust held some stock; Bayonne ceased dumping even a portion of its acid sludge in the Atlantic Ocean in 1891. Some of the coke was burned

at the refinery, some disposed of as commercial fuel, and some sold for the manufacture of carbon points for electric lights.[49]

Other changes at Bayonne reflected the adjustments which refiners had to make during the late 1880's. The plant's consumption of crude dropped from 3,182,168 barrels in 1890 to 3,099,543 a year later. The kerosene yield declined from 81.42 per cent during the first six months of 1889 to 73.69 per cent in the last six months of 1891. While that change was occurring, the percentage of naphtha rose from 6.88 per cent to 13.75. The naphtha yield of all Standard Oil refineries increased from 10.37 per cent in 1885 to 14.23 in 1890, a result attributable partly to the advent of Lima-Indiana crude and partly to a rising demand for gasoline manifested in larger sales, higher prices, and the importunities of marketers.[50]

SYSTEMATIZING DOMESTIC MARKETING

During these years, moreover, Standard Oil's domestic marketers possessed for the first time a special agency for presenting their views to the refiners and for co-ordinating all distributive operations. The formation of the Domestic Trade Committee in 1886 marked the increasing systematization of Standard Oil's marketing.

W. H. Tilford, who recommended this move to the Executive Committee, gave several reasons for the addition to the growing galaxy of major committees. He believed that distributing companies should report to and confer with some central and controlling authority. Sharing of information and consultation would increase their knowledge of domestic trade. A central body would aid the marketing companies in adjusting to each other's policies and help them to meet outside competition. It would provide a mechanism for arbitrating and adjusting differences between the refining and marketing interests.

Although Tilford was arguing on general principles, the timing of the letter indicates that the current situation provided potent reasons for the move. Loyalty to local divisions was stronger than that to "the general interest." Motivated by the natural urge of marketers to report a growing volume of sales, agents were stepping into each other's territories. There was a "cutting of each other's throats," as Warden frankly characterized it. Friction existed between the Cleveland office and some other Standard Oil marketers, notably the Pittsburgh group. The fact that Frank Rockefeller, an outspoken critic of others, had his brother John's ear undoubt-

edly encouraged other marketers to desire an impersonal body to consider disputes. John D. Rockefeller himself agreed.[51]

Under the able chairmanship of W. P. Thompson, the committee served as a clearinghouse for marketing problems. It appointed one man to improve the construction of bulk stations "by a censorship" of new buildings, instituted more thorough inspection of Standard Oil's bulk stations,[52] and considered a wide range of marketing problems.

Although price policy continued to be a matter of debate, a special experienced group now gave attention to domestic prices. In 1885 Flagler had commented to Rockefeller: "We may be at fault in holding price too high but there seems great difficulty in getting the Ex[ecutive] Com[mittee] to consent to a reduction in prices." At that time Brewster was advocating prices which, though low enough to discourage new construction by competitors, would be high enough to encourage outsiders to continue business without a fight. As discussed earlier, only a part of Standard Oil's reduced manufacturing costs of that year were passed on to buyers. Now the Domestic Marketing Committee carefully watched prices charged to the marketers who bought from Standard Oil. While all schedules were constructed with the committee's advice, reductions were made in localities where vigorous competition prevailed. Comments in 1886 indicate that some executives thought the organization was still allowing too wide a margin of profit; as a result, the committee recommended adjustments in many schedules during that and the following years.[53] In 1888 John D. Rockefeller summed up the general consideration in setting prices: "We want to continue, in reason, that policy which will give us the largest percentage of the business."[54]

The relation of the Domestic Trade Committee to separate marketing companies had to be worked out by experience. Frank Rockefeller recommended that none of its members should be directors of marketing companies. He contended they should be "salesmen for the manufacturer, and not biased by their interests" as directors of marketing units, which made them act as purchasing agents.[55] The reorganization of several companies removed some of the causes of Frank Rockefeller's criticism, and the marketing scope of Ohio Standard was also limited. Products sold in the West from Eastern refineries had moved through Ohio Standard as those for export were handled by New York Standard. New marketing companies were established in close relationship with the Domestic Trade Committee, which took over this central function of the Ohio Company.

The Domestic Trade Committee heard, heeded, and presented to the

Executive Committee the same arguments voiced earlier for Standard Oil's owning more of its own marketing outlets and exercising a close supervision over them. Under central leadership the marketers of Standard Oil products could meet competition more easily. Outright ownership would do away with the pressures from wholesalers for special rebates and with their playing one manufacturer off against another. Frank Rockefeller, who always saw clearly the mote in his neighbor's eye, believed that unless Standard Oil fully owned and more thoroughly supervised marketing stations it could not enforce its standards. By mixing oils to meet competitors, some marketers were not upholding the specifications established by the manufacturers of Standard Oil products. Reports came to 26 Broadway of breaches in the enforcement of the principles of fair gauging, honest branding, and the use of the most economical methods of marketing. Investigation of complaints about the Consolidated Tank Line's practices, and the frank explanation of its top management, indicated that an individual employee had been overgauging for his personal, not his company's, gain, but such a situation itself pointed to the need for a tighter rein.[56] Even more frequent were the protests within Standard Oil that partly owned marketing companies were not transmitting to retailers special reductions in price, such as those made in 1887, but were retaining them to the increase of their own profits, if not of their volume of sales.[57]

In response to these arguments Standard Oil marketers expanded their system, utilizing a variety of methods. Companies in the combination constructed new plants. Several small marketing units were purchased outright and added to the Standard Oil Trust, which also bought out the minority interest in several existing marketing companies, where age, health, retirement, poor management, or differences of opinion made unsatisfactory the existing status. Because of a failure to agree on price, attempts to buy out Pierce's minority interest in the Waters-Pierce Oil Company did not succeed. Later developments in Texas indicated that it probably would have been better to have met Pierce's high offer.[58]

Where companies were bought out, they sometimes continued for a time as separate units in Standard Oil. Since good lively marketers were in short supply, the personnel was usually added to Standard Oil's salary list, but there were exceptions, where Standard Oil men characterized the manager of the firm as "groovey and antagonistic to our interests," or the firms as "little bits of narrow-gauged institutions."[59] The names of some firms were kept for a time to reap the gains from the good-will purchased.

As early as 1886, however, Thompson was recommending that Standard Oil discard all "'nom de plumes' and side shows," and "in a bold manly way, handle its own goods in all sections of the country."[60]

Standard Oil executives organized new companies on the basis of a purchased nucleus, either created by outsiders or transferred from existing Standard Oil units which had operated over a wide area. The Trust, having bought out F. D. Carley's interest in the Chess-Carley Company, organized the Standard Oil Company (Kentucky) in 1886, with a capitalization of $600,000, to handle the marketing south of the Ohio River and east of the Mississippi. The small Standard Oil Company (Minnesota), chartered the following year, assumed wholesaling functions in its home state and North Dakota, previously parts of the domain of Ohio Standard. When the ill and aging manager of the P. C. Hanford Oil Company asked in 1890 to sell his remaining interest to the Trust, the Standard Oil Company (Illinois) with an authorized capital of $1,100,000 was formed to take over the business of the earlier corporation.[61]

Both new and old companies within Standard Oil bought some and constructed other new bulk stations. The number of the combination's stations rose from 130 in 1882 to 313 in 1888, after which they increased more rapidly. These were usually contiguous to railroads and similar to earlier ones. It was Pierce's boast that he followed all new railroad construction with a chain of new bulk stations.

Jersey Standard's acquisition of stations followed the general pattern. A new station was built at Paterson, New Jersey, but at Newark the plant of the McKirgan Oil Company, the stock of which the Trust had held, was purchased. Those plants and the Jersey City station, which brought the company's total number up to three, were supervised by George F. Gregory as part of his work as head of the Domestic Trade Department of New York Standard.[62]

Standard Oil gradually extended distribution to retailers by tank wagons where conditions favored their use. Inventories of Standard Oil's major wholesaling companies in the heavily populated area from the Atlantic Ocean to the Mississippi River and from the Canadian border to the Carolinas showed only 252 tank wagons, 992 horses, and 11 mules by 1889. The Continental Oil Company, operating in a mountainous district with scattered population, had introduced tank wagons in only one city, Denver, by that time. Yet the number of tank-wagon drivers, or "circuit salesmen," on the salary records of the Trust slowly increased. By 1892 almost a third of the combination's total sales of kerosene for "Home

Trade" were delivered to retailers by the efficient tanks mounted on wheels.[63]

Several other smaller innovations aided in improving marketing. As early as 1891, The Atlantic Refining Company installed automatic measures on its tank wagons. Managers of bulk stations, which were more closely inspected than earlier, applied rules for cleanliness similar to those laid down by the Manufacturing Committee for tankage on refinery grounds.

The long pull to extend centralized supervision and advisory functions by George H. Hopper's barrel-preparing and -filling department finally reached fruition.[64] In 1889 the Cooperage Committee, after a year's study by a subcommittee, recommended that the marketing companies should appoint thoroughly competent managers of cooperage at all their respective large bulk stations, general supervision to be exercised by Hopper.

Probably both to come to a working arrangement with competitors and to reduce transportation costs, the Continental Oil Company in 1888 acquired a minority interest in the United Oil Company, a producing and refining corporation in Florence, Colorado. The Continental agreed to distribute all the latter's light products. The capital acquired from the Continental's investment enabled the United to expand its production and soon to more than double its refinery throughput. At almost the same time, the Standard Oil unit agreed to take a portion of the manufactured products of the Florence Oil & Refining Company, the amount to be equivalent either to forty barrels daily or to 20 per cent of Colorado's production.[65] Continental was able to fill some of its needs without paying the long transportation cost from the nearest Standard Oil refinery and to tie to itself the major independents in Colorado.

The maintenance of the lowest possible transportation costs continued to be a matter of pressing concern to the Standard Oil Trust. Until the passage of the Interstate Commerce Act in 1887 made the practice illegal, Standard Oil men diligently sought rebates on shipments of manufactured products; as Howard Page testified later, "It was a man's business to get as low rates as he could."[66]

That fact, plus loose central supervision of Standard Oil relations with railroads as a consequence of Flagler's preoccupation with his Florida ventures, created a complicated situation in 1886. "Every division of the business," wrote O'Day to Rockefeller in September, "seems to be obtaining rates on its own hook, regardless of how anything they might do might conflict with other things."[67] Marketers had succeeded in getting "the

rates down to the lowest possible notch," a result which O'Day thought not to the best interest of the combination. Railroads were, as he phrased it, "quietly seeking the business of our competitors." Within a week reports reached Rockefeller that a group of refiners in Cleveland, Pittsburgh, and the Oil Regions had formed "a sort of syndicate or pool for the purpose of protecting their business by securing the lowest rates of freight from and to all points in the United States."[68] The Baltimore & Ohio Railroad had recently threatened to go into refining, and the Pennsylvania management consistently provided tank cars for outsiders while usually refusing them to Standard Oil at times of marked shortage.[69]

O'Day recommended the appointment of a man to co-ordinate all the freight business of the combination. Within a few months Howard Page was brought from Kentucky Standard to 26 Broadway to perform that vitally necessary function.

After the passage of the Interstate Commerce Act, Page and Standard Oil marketers had their hands full in adjusting to the regulations of the federal government. They ceased taking rebates but labored assiduously to get products classified in such a way as to subject them to the lowest possible railroad tariffs, took advantage of intrastate schedules, and adopted other means deemed legal by Standard Oil counsel in keeping transportation costs to a minimum. Executives located refineries at the best points for low transportation costs at existing rates. Greater care was taken to gauge tanks cars accurately. New contracts with railroads (with 166 out of 196 lines hauling Standard Oil's tank cars by the end of June, 1888) provided for payment of mileage to the combination on both loaded and empty movements of its tank cars, instead of merely on loaded cars as formerly; this change helped in part to offset the fact that freight was charged in both directions. For shipments east, rates on barreled oil in carload lots and those on tank cars were the same for a time, a disadvantage to the shipper who used the more efficient method, as Standard Oil's rival, Scofield, Shurmer & Teagle, agreed. In the decision in a case brought by that Cleveland firm, the Interstate Commerce Commission stated in 1888 that railroads must charge the same rate on oil in tank cars as in barrels, but that they might charge for the weight of the barrels. The decision resulted in raised rates, but Standard Oil considered the new ruling favorable to bulk shipments. This, and the difficulty faced by the combination in getting enough tank cars from railroads when it did not supply its own equipment, induced the Executive Committee to order an expansion of its rolling stock.[70]

Within three years the ownership of almost all cars belonging to Standard Oil companies was vested in the Union Tank Line Company, a New Jersey corporation capitalized at $3,500,000. The new company took over Ohio Standard's 5,833 tank cars, 17 dismounted tanks, and 40 rack cars, which were used to carry barrels to the Far West.[71]

Meanwhile Standard Oil men had adopted the least expensive methods of bulk shipment along the Atlantic Coast. By 1888 the combination owned and operated not only the *Amelia Ireland,* a bulk schooner, but also the *Standard,* the first tank steamer built in the United States. Within two years New York Standard could report the ownership of another tank steamer, the *Maverick,* and another bulk schooner, the *Crusader.* These facilities supplemented the twenty-seven barges, twenty-eight tank boats, and sixteen lighters belonging to Standard Oil companies, not to mention vessels under charter.[72]

In spite of many changes, reports of marketers on general marketing conditions and the policies of rivals sounded much like those of earlier years. While outsiders were damning Standard Oil practices publicly, an accepted competitive measure of the time, salesmen within the combination were relaying their problems to 26 Broadway. Those in Cleveland, who watched small refiners in Pennsylvania grow in strength and gain an increasing percentage of the oil business in the West, attributed their rivals' success to the use of inexpensive natural gas for fuel, cheap iron which encouraged the construction of new stills, and the favorable freight rates which the Oil Regions enjoyed. Competition was fiercest in a group of cities; Chicago particularly served as the "dumping ground" for competitors until the P. C. Hanford Oil Company was superseded in that large market by Standard Oil Company (Illinois). Local price cutting was endemic and, according to Standard Oil reports from the field, always initiated by rivals. To meet Scofield, Shurmer & Teagle's aggressive campaign in Des Moines in 1886, Thompson declared that he had had to cut prices to the "naked cost." To enable Standard Oil marketers to show profits, refiners of the combination either reduced quoted prices or sold insiders oil below quoted prices or gave rebates to members of the family or made up losses of field offices at the end of the year. With regard to competitors' behavior, perhaps marketers of any line at any time can sympathize with Squire's lament in 1890: "Their policy with their traveling men is to *sell* their oil."[73] Yet in volume of sales and marketing techniques Standard Oil men held their own. Violent fluctuations in their percentage of highly competitive markets were necessarily a part of the salesmen's normal life.

If Rockefeller and his associates ever reviewed their operations of the six years prior to 1892, they must have been impressed with the labors and achievements of the Standard Oil army of men. They had attained full vertical integration for the combination. In doing so they had succeeded in helping to avert the threatened shortage of raw materials by entering large-scale production of crude oil in the Appalachian and Lima-Indiana regions. Successful activity in the latter had involved extension of Standard Oil dominance of the American petroleum industry to a wider geographical area and the investment of vast sums in the buying, transporting, storing, and manufacturing of sour crude. While conquering sulphur-laden oil and reversing their policy of depending almost entirely on purchased petroleum, Standard Oil executives had taken the combination into and practically out of the natural gas business, had pushed their pipeline facilities into new producing areas, and had continued the gradual adoption of mass-manufacturing techniques. In the process of adjusting to new conditions of manufacture and fluctuations in the markets for petroleum products, top managers had moved slowly nearer to the retailer and to methods of mass distribution. Sales grew in volume year after year; those for kerosene in home trade increased more than 40 per cent between 1885 and 1888, and the volume in the latter year reached almost six million barrels of forty-two gallons.[74] Also, as discussed in Chapter 5, Standard Oil had acquired interests in shipping and marketing affiliates abroad. To its creators and managers the record of the entire ten years since 1882 must have seemed to be a triumphant vindication of systematic, large-scale organization and administration, but the profits and size of the Standard Oil combination, not to mention some of its methods and monopolistic tendencies, engendered wide criticism and attack in the press, legislatures, and courts of the United States.

Chapter 8

Public Pressures and the Rise of Jersey Standard

THROUGHOUT the years that Rockefeller and his associates were building their mighty enterprise they came under almost continuous attacks by public and press. Acting on strong convictions, large segments of the voting public united in condemning the newly arisen Big Business and in putting upon state and federal statute books legislation regulating both railroads and industrial combinations. One consequence was a successful suit against The Standard Oil Company (Ohio) and the initiation of the voluntary dissolution of the Trust. A second result was the reorganization of the Standard Oil companies and the emergence of Jersey Standard as one of the leading corporations among them.

ATTACKS AND CONCEPTS

Between 1872 and 1892 the Standard Oil combination came to stand before the bar of public opinion as the epitome of the evils of Big Business. The Trust was pictured as bloated in size, as a creation of railroad rate discriminations, and as a menace to free enterprise in the United States. The public concept of the organization was based partly upon misunderstanding of the developments that were taking place, partly on opposition to an industrial giant obviously contravening strongly held American views on free competition, and partly upon the mistakes of Rockefeller and his associates in the management of the Standard Oil combination.

The purpose of this section is to state briefly the general opinions held about Standard Oil and to indicate why they had arisen. It would be impossible here to examine the truth or falsity of all allegations. The discussion of policies and practices of the Standard Oil group is the subject of the other chapters in this volume, and many of the events mentioned here are discussed more fully in Nevins' study of Rockefeller.[1] It is important in understanding the history of the business, however, to have a general picture of the public atmosphere in which it operated.

The broad outlines of the public's picture appeared during the years 1872-1877. John D. Rockefeller and many of his later associates were identified with the South Improvement Company, characterized as an iniquitous scheme which aligned all its stockholders with predatory railroads and as one which the Cleveland members utilized to bludgeon most refiners in that area into Ohio Standard. Though federal and Pennsylvania legislative actions in 1872 did little more than arouse curiosity, the union of refiners from Cleveland, New York, Philadelphia, the Oil Regions, Pittsburgh, and Parkersburg into the Standard Oil alliance by 1875 soon became a matter of common knowledge among oilmen. Almost all the refiners in the country participated in The Central Association and enjoyed the advantages of favorable railroad rates at one time or another from 1875 to 1877. Meanwhile, members of the alliance, though trying to operate secretly, were known to be buying up and dismantling a large number of small refineries and tar stills in the Oil Regions, Pittsburgh, Baltimore, and Parkersburg.

Details and color were added to the picture during the years 1877-1881. The open fight with the Pennsylvania Railroad dramatized the tremendous power of the alliance, which defeated what was generally regarded as the strongest railroad corporation in the United States. Known to oppose the right of eminent domain for pipelines in order to discourage competition, Standard Oil was reported to be using venal methods to attain its ends. As the excessive and uncontrolled production in the Bradford field drove crude oil prices downward after 1876, the producers placed the blame upon the Standard Oil combination because it dominated the gathering system in the producing area. The producers instituted *quo warranto* proceedings, an injunction suit, and conspiracy litigation during 1878-1879, which brought both the strategy and tactics of the Standard Oil executives to public attention. Legislative investigations of railroads in Ohio, West Virginia, and New York, and Standard Oil's contest with Tide-Water Pipe, crystallized the picture of Rockefeller and his associates as evasive, arrogant men grown rich and powerful upon railroad rebates, while buying out little businessmen at low prices by the dozen. Not until later did a critic openly accuse Standard Oil on another score, namely, that all "or nearly all" of Standard Oil purchases "were made at prices grossly in excess of the reasonable value of the material and business sold; the chief consideration being the absorption and accumulation of power which the monopoly was thereby acquiring."[2] New information on agreements of Standard Oil with Cleveland com-

petitors and on railroad favors to the combination came out in 1880 with the injunction suit of Ohio Standard against Scofield, Shurmer & Teagle, and a suit by that firm against the Lake Shore & Michigan Southern Railroad a year later. In March, 1882, the New York *Oil, Paint & Drug Reporter,* which had begun a crusade against the alliance five years earlier, failed "to see how any entirely new crimes could be charged to it."[3]

Henry Demarest Lloyd projected the image upon the national screen. He set the stereotyped concept of Standard Oil for the nation and the world in his "The Story of a Great Monopoly," published in *The Atlantic Monthly* for March, 1881. Although the focus for his attack was the irresponsible behavior of the railroads, the Standard Oil combination was set forth as the prime example of a monopoly established as a consequence of railway iniquity. Standard Oil growth, profits, wealth, and power were attributed directly to preferential treatment by the railroads —rebates on its own and competitors' shipments, drawbacks, and other favors. In the exercise of its monopolistic power, said Lloyd, Standard Oil had killed off or frozen out or bought out at low prices almost all the small refiners in the country. It controlled the price of crude oil through its ownership of pipelines and imposed its will upon the price of the manufactured product through doing 90 per cent of the refining. Similarly, he stated that Standard Oil ruthlessly and unscrupulously dominated the marketing of kerosene in the country and through exorbitant monopoly prices exacted an enormous tribute from the American consumer every year.

John Collins Welch, editor of the *Monthly Petroleum Trade Reports* (1874-1887), first acted as the newspaper spokesman for small producers and refiners in the Oil Regions, but George Rice, a small refiner in Marietta, Ohio, soon epitomized the underdog fighting for the principles of justice and free competition. Active in southeastern Ohio since 1872, he had been one of the many to experience the slashing competition of the McDonalds, F. D. Carley, and Henry Clay Pierce in the Mississippi Valley. In fact, Rice invited combat by darting into an area, cutting prices until dangerous to profits, and then diverting his efforts to another spot. In 1881, under the title of *Black Death,* he published a pamphlet of anti-Standard statements, chiefly about activities of Chess-Carley in Columbus, Mississippi, collected from a number of newspapers and periodicals. Even his advertisements read "Anti-Standard"—"Anti-Monopoly." Standard Oil officials tried to silence him by attempting to purchase his refinery, but they balked at paying his asking price, which rose from

an original \$20,000 to a final \$500,000.[4] This represented either his reassessment of his nuisance value or a remarkable growth in net assets within less than a decade in the face of competition from a monopoly.

Most of the stones thrown by the self-constituted David at the Standard Oil Goliath were freely provided by the target. Rice collected letters from dealers supporting charges of price cutting, threats, and coercion by Chess-Carley and Waters-Pierce, and of espionage by railroad employees on behalf of those two Standard Oil marketers and others. His assembled data found their way either to the *Oil, Paint & Drug Reporter* or to newspapers in one form or another. When National Transit began operations directed toward building the Macksburg trunk line to Parkersburg in 1884, Rice apparently tried to thwart it by leasing land across the proposed right of way. Whether in retaliation or not, Daniel O'Day of National Transit soon arranged to receive a drawback on Rice's supplies of crude oil carried by the local railroad. The doughty Rice carried the matter to court. Although the drawback was not repaid until six months after its collection, S. C. T. Dodd always maintained that he had repudiated the agreement with the railroad prior to his knowledge of any legal proceedings and that the unfair collections were returned before the decision was reached.[5] Utilizing his own experience and data gathered from many sources, Rice became a professional litigant. He testified before state and national legislative bodies and instituted a series of suits against railroads and Standard Oil companies or other officials. He was a gadfly to Standard Oil executives until his death.

Without the aid of Rice, information about Standard Oil was brought to light or reiterated in public investigations and numerous legal cases during the 1880's. Many people regarded the failure of Pennsylvania to win in its attempts in 1881-1882 to tax Ohio Standard's properties outside the state as a miscarriage of justice, and this feeling was bolstered by the revelation a year later that E. G. Patterson, who had collected much of the material on the tax case, had ceased his attacks on the Trust. Brewster, Flagler, and John D. Rockefeller appeared as witnesses in a New York Senate investigation on corners in commodities in 1882-1883. The suit of Scofield, Shurmer & Teagle against the Lake Shore & Michigan Southern, which dragged on from 1881 to 1886, not only added further facts about Standard Oil's rebates from the railroads but also aired accusations by Mrs. Fred M. Backus that she had been mistreated when her refinery was purchased in 1878. A similar claim by Mrs. Sylvia Hunt of Baltimore also gained currency. Another widely disseminated and

widely believed allegation was that Standard Oil bribed the legislature of Ohio to elect Henry B. Payne, father of the Trust's Oliver H. Payne, as United States Senator in 1884.

Most damning of all perhaps were the impressions arising from the failure of the Billingsley Bill to pass the Pennsylvania legislature in 1887. It was a measure intended to force an arbitrary reduction in National Transit's pipage and storage rates and to set high penalties for violation. National Transit men lobbied openly against the bill. When it failed to pass the upper house, its proponents accused Standard Oil men of bribing at least five senators, a contention which appears to have had some basis in fact.[6]

On the other hand, the hostile press occasionally made remarks so extreme as to betray complete loss of perspective. In reporting the shift of a Standard Oil female employee between New York and Cleveland, the *Oil, Paint & Drug Reporter* for January 9, 1884, printed, under the headline of "The Standard Oil Company as a Social Monopoly," the following comment: "The Standard Oil Company not only owns and runs Cleveland but it also holds a first mortgage on the bodies and souls of the Cleveland people." That was a mild statement compared to many published by Pulitzer's *World*.

One peak in the *World's* misrepresentation came in connection with the cases of the Buffalo Lubricating Oil Company, Limited, against the Vacuum Oil Company. Buffalo Lubricating was formed by three former employees of Vacuum who had adopted its processes, copied its machinery, carried away its list of customers, and apparently hoped to force Standard Oil to buy them out for $250,000. Vacuum won only one clear-cut victory in three attempts to prove infringements of patents and experienced public denunciation in conspiracy suits brought by Buffalo Lubricating. Although charges of conspiracy against Archbold, Rogers, and McGregor were summarily dismissed by the court as having no foundation in fact, a jury decided that Vacuum's top executives, H. B. and C. M. Everest, were guilty. Six jurors later signed affidavits that they voted as they did on the ground that the Everests had actually enticed back one former employee while he was still under contract to Buffalo Lubricating. The judge assessed only the small fine of $250 upon each of the two executives. The *World* played up all the allegations of the Buffalo partnership, including an unsubstantiated charge that the Everests had instigated an attempt to blow up the plant, but played down the final decision and never corrected the false impressions. Nor did the *World* in-

vestigate the fact that two judges and their law partners, closely associated with the local district attorney's office, presented a bill to Buffalo Lubricating for more than $40,000, which, had it been honored in full, would have eaten up almost half of the entire selling price of the works to the Atlas Refining Company in 1888.[7]

Members of the same group of Buffalo lawyers apparently induced Samuel Van Syckel to start suit against the Acme Oil Company in 1885 for damages arising from the unlicensed use of his continuous process in refining petroleum. At first the plaintiff, who had been aided by Archbold earlier "more out of kindness than anything else," claimed $110,000 but later scaled the figure down to $12,000. Though continuous distillation had not yet been commercially successful in the United States, at the direction of the judge the jury brought in a verdict of six cents for Van Syckel. By that time (1888) his two sons had already been in the employ of The West India Oil Refining Company, a Standard Oil firm, for many years.[8]

Additional grist for the mill of the press came early the next year. Along with other prominent businessmen in other industries, Rockefeller and Archbold testified about the activities of Standard Oil before the members of the New York Senate Committee on General Laws in its investigation relative to trusts. The proceedings, as reported from day to day and published as Senate Report Number 50 of 1888, elicited full information upon the Trust Agreement and considerable data upon the operations of the Trustees. Almost at the same time the Committee on Manufactures in the House of Representatives held hearings at which appeared several Standard Oil officials and many of their competitors. Little new evidence was presented against the Trust, but many data previously adduced were repeated. George Rice spread his damning documents and testimony upon the record and was frankly corroborated in general as to marketing in the South by F. D. Carley. At the same time, Rice was presenting before the Interstate Commerce Commission complaints as to railroad discriminations against him, of which some were accepted and some disallowed. He had also instituted a suit in New York State, which he won in 1890, to compel the Trustees of the Standard Oil Trust to transfer to him a certificate for the six shares which he had bought in order that he might legally acquire information about its inner workings.[9]

After reviewing the growth of the Standard Oil Trust, the New York Senate Committee expressed the opinion that "the people may well look with apprehension at such rapid development and centralization of

wealth, wholly independent of legal control." The attitude and convictions of that committee were expressed in a portion of the report, as follows:[10]

> No witness came forward to accuse it [the Standard Oil Trust] of the great offenses commonly laid to its charge. No proofs were made of its rapacity or of the greed with which it lays hold of every competitive industry, except such as might be drawn from the fact that it is almost the sole occupant of the field of oil operations from which it had driven nearly every competitor. No witness appeared to prove its power over railroad and transportation companies and to wring from already impoverished lines better terms than other shippers, except such as might be drawn from the admission of its officers, made with hesitation, that its wealth and the amount of its business enabled it to obtain better terms than its poorer competitors.

Although the Standard Oil Trust found supporters among some conservative elements in the country, and some newspapers and periodicals attempted to establish a balance between proved facts and unsubstantiated allegations, the general picture cherished by major elements of the public was that of a vicious, venal menace. In general the broad brush strokes were as follows: the Standard Oil Trust was a dangerously powerful monopoly, and all monopolies were contrary to the general welfare; it had achieved its monopolistic position as a result of gross discrimination by the leading trunk-line railroad systems; in the course of erecting and operating the monstrous combination, Standard Oil officials had used rebates, control of tank cars, and various associations to kill off small refiners or to force them into the combination or to compel them to sell at ruinously low prices; they had utilized the gathering and trunk pipelines as a means of imposing their will as to prices of crude oil upon the defenseless producers; they had practiced espionage upon competitors and cut prices in order to kill off wholesalers and jobbers of refined products in competitive areas, only to reinstitute high monopoly prices after the death of competition; they had bribed and corrupted legislators and had grown prodigiously wealthy as a consequence of these measures; John D. Rockefeller was regarded as the leading figure among the Standard Oil executives responsible for the entire record of antisocial behavior.

Small wonder that the Standard Oil Trust was on the minds of all congressmen during the late eighties. It was the first of the great trusts and one of the early large combinations of capital in the United States. The proved favors of railroad companies to Standard Oil, though it was

only one of many recipients, contributed to the passage of the Interstate Commerce Act in 1887. The combination constituted one of the prime targets of the Sherman Antitrust Act, which was passed three years later and which had both supplemented and inspired similar legislation in several states by 1892.

Two elements in particular are of prime importance in assessing the wide reception accorded the allegations against Standard Oil by the public. Rockefeller and his associates operated a business singularly exposed to public attack. They bought their raw material from thousands of producers of crude oil, who always behaved like the placer miners of Bret Harte's West; petroleum producers were eternally fighting for their right to every available drop of oil and until 1887 never admitted that falling prices were related to their own excessive competition in extracting the mineral from the earth. Standard Oil's situation at the other end of the manufacturing process was even more vulnerable; petroleum products went into millions of homes through the hands of tens of thousands of wholesalers, jobbers, and retailers, who naturally blamed the big corporation whenever affairs went awry. In many instances responsibility did lie with the combination, but in many others it certainly had little to do with difficulties and failures. It was an easy matter to get into producing petroleum and still easier to take up jobbing and retailing, but it was just as easy to fall out.

In contrast to Standard Oil, the United States Steel Corporation during its early years purchased its ore from a handful of suppliers and numbered its customers only in the hundreds. Few of its products went directly into homes of ultimate consumers. Although the Steel Corporation was as big a target as the Trust, the number who were immediately concerned with it enough to shoot at it, or sympathize with the attackers, was incomparably smaller.

Many considerations must be weighed in order to approximate a reasonably accurate and fair evaluation of the Standard Oil story. Hatred of monopoly was traditional among the citizens of the United States, and bigness itself was distrusted by many of them; the destruction of the first and second Banks of the United States was proof of that. Even if monopoly was far from achieved, bigness immediately became monopoly in popular usage. American economic life was overwhelmingly dominated by individualistic small farmers and businessmen who believed in free competition and failed to appreciate that the fiercely competitive situation in oil and other businesses bred combination. Few indeed per-

ceived that a national system of railroad and telegraphic communication had created a national market which demanded service by large aggregations of capital—Big Business. Most men were ignorant of or ignored the significance of depressions in forcing businessmen to seek safety and stability through consolidation. Dependent upon winning their case or pleasing the voters for their livelihood, lawyers and politicians naturally elicited in cases and investigations points to substantiate their positions and had no interest in developing a substantiated body of fact for balanced judgment.

Given those circumstances, a number of factors in the general situation become understandable, though still requiring evaluation. It was quite natural for the freedom-loving public, always sympathetic to the underdog, to fail to set off against the disappearance of marginal and submarginal producers, refiners, and marketing middlemen the advantages of large-scale production and large-scale distribution, particularly when those advantages were vehemently denied by competitors of Standard Oil and of other large businesses. Even in our day most people are not reconciled to the fact that economic change, even for the better, requires that a price be paid. It is comprehensible that western Pennsylvania pride should color the contentions of independent oilmen in their attacks upon their nemesis. Attacks on the Trust were normal competitive practice among rivals of Standard Oil. It was natural, too, that the hostile press should cater to the convictions of the public about Big Business and should simplify the picture by focusing attack upon one combination—Standard Oil. Similarly, the charge that the Trust had gained its preeminence in the oil industry through its relations with the railroads was the normal American oversimplification; the farmers of the Mississippi Valley were also placing much of the blame for their economic situation upon the railroads at the same time. Incidentally, a full historical explanation of the evolution of the rebate system would be helpful in putting the entire economic and political scene of the post-Civil War period in a truer perspective.

TOO LITTLE TOO LATE

The immediately significant fact, however, was that to the steady drumfire of attack Standard Oil executives offered no effectual counter. During the 1870's and early 1880's Rockefeller and his associates in general maintained a stoical and aloof silence, though a few exceptions were made to the rule. They assumed that their business was their own and that the

public was being grossly misinformed. As the Standard Oil men viewed the situation, although acting for their own long-term interests, they were making tremendous efforts to serve producers and consumers; both groups would appreciate the true facts in the long run. By the late eighties Standard Oil leaders began to change their tactics, but their actions and their means proved unavailing against the rising tide of public suspicion.

By and large, Standard Oil executives relied upon their services and their products to silence criticism and to sell the Trust to the public. For the producers they provided a pipeline to almost every well, storage facilities for almost every barrel of oil extracted, and a means of marketing oil immediately. Since early 1880 prices of crude oil had been set on the oil exchanges. Managers of the combination sought to please marketers and consumers in almost innumerable ways. Standard Oil manufacturers did indeed improve quality and conscientiously try to maintain uniformity as specified. Although the manufacturers occasionally failed in their efforts during the early eighties, the lack of any consistent attack on the score of quality indicates that the record was substantially as top management intended. Undoubtedly the institution of careful inspection of all products and the manufacture of special wicks for kerosene from Bradford crude oil contributed to the result. While complaining at the few slips in quality, jobbers and retailers were able to rely upon Standard Oil's regular service and thereby to maintain smaller inventories. Although some jobbers were angry at being bought out, the rest were usually satisfied at the security and opportunity assured by being in the employ of the Standard Oil Trust. Though Standard Oil's gradual expansion of its influence in manufacturing and marketing was motivated largely by a desire to increase sales and maximize profits, the changes resulted in passing along to the consumer some of the savings brought about by large-scale production, bulk distribution, and the elimination of middlemen. The foregoing points are developed in Chapters 4 through 7 of this volume.

Although generally pursuing a policy of silence, in the early days of the Standard Oil Trust its leaders did take a few measures in response to hostile criticism. No direct reply was made to Lloyd's articles in *The Atlantic Monthly*, but when Rice's *Black Death* appeared, Flagler acquired a copy, revised it by adding excerpts favorable to Standard Oil, and circulated the revision widely through jobbing outlets. Such an action as that was so unique that the then highly critical *Oil, Paint & Drug Reporter* commented, "It is very unusual for the Standard to squeal but in this case they have been made to fairly burst out."[11]

The first public defense of Standard Oil actions appeared as a part of a printed debate between J. C. Welch and J. N. Camden, a United States senator and early participant in the alliance. It was published under the title of "The Standard Oil Company" in the *North American Review* for February, 1883.[12] Welch led off by stating: "If there was ever anything in this country that was bolted and barred, hedged around, covered over, shielded before and behind, in itself and in all its approaches, with secrecy, that thing is the Standard Oil Company." But he insisted that enough information had come out for the public to know that the combination had erected its great power through control of transportation, especially the railroads. From there he went on to cite the South Improvement Company's contracts, as well as later ones between Standard Oil units and the railroads, including those giving Standard Oil drawbacks upon competitors' oil.

In general, Camden stated his reply succinctly and with measured restraint. He began by adducing data to portray the growth of the oil industry in the United States, then said: "The specific agency through which this volume has been mainly effected is the organization known as the Standard Oil Company which may be defined to be an association of business houses united under one management in such a manner as to insure harmony of interests, and a consolidation of capital adequate to any possible business emergency, yet each retaining its individuality, and even competing sharply with the others." As Camden saw it, that association had been formed to curb the speculation, waste, and overproduction in crude oil and in the manufacture of petroleum products. When pools and "running arrangements" failed to restrict the excess manufacture, bankruptcy took many and threatened all. Since Standard Oil men could do nothing to control production, they concentrated upon limiting manufacturing. After uniting the principal refining interests, they invited others in and bought out many more, then dismantled badly located or poorly equipped refineries and improved others, actions which, in his opinion, vindicated their wisdom and the superiority of their business methods. By these means Standard Oil won a commanding position in refining, and oils grew better, cheaper, and more uniform. Camden also paid tribute to the great accomplishments of the group in storing oil and piping it.

Camden's summary statements of what Standard Oil had done constituted a mixture of fact and some contentions difficult to prove. During the preceding decade, he maintained, the Standard Oil association of companies had been the instrument, if not the cause, of almost the whole

development in the American oil industry, production excepted, particularly in improving, making uniform, and pushing petroleum products in the markets of the world. The companies were furnishing employment to a host of men equal to the standing army of the United States and giving an impulse to prosperity in every locality where operations were conducted. Standard Oil had less trouble with its labor force, he claimed, than any other corporation of comparable importance. Its success was the cause of the heavy abuse leveled at it. Standard Oil was not a monster; it never had a contract with a railroad company which a fair-minded man could pronounce to be against public policy, good morals, or business principles; it had never broken an agreement or committed an act of treachery; it was not a speculator or manipulator of speculative prices; it was not a monopoly despite its preponderance in the trade. "It is nothing more nor less," said Camden, "than an organization of laborious painstaking men who with great abilities and great opportunities have made a success by legitimate means in a legitimate business."

Camden's defense of the combination was really an exception to the general Standard Oil rule of unobtrusive action in public relations. During the 1880's Standard Oil officials maintained financial ties with some newspapers. In 1881 Ohio Standard carried on its books $10,000 in stock of the Cleveland *Herald*, originally acquired two years earlier. At the same time The Derrick Publishing Company, owner of the *Oil City Derrick*, came under the management of W. J. Young, an intimate associate of J. J. Vandergrift, which may account for the "special investment at Oil City" carried on the books of Ohio Standard and then of National Transit in the early eighties.[13]

The relation between Patrick Boyle and Standard Oil has been a subject of debate since he bought the *Oil City Derrick* in 1885. Boyle vehemently denied that the Trust or any Standard Oil unit owned a portion of the *Derrick* after he assumed control and also insisted that he bought the *Toledo Commercial Gazette* in July, 1889, entirely with his own funds. While evidence of a few loans to other papers exists, there is none of loans to Boyle at that time, although a small one was later made to his Bradford *Era*, as discussed in a subsequent chapter. When his acquisition of the *Derrick* resulted in public accusation of Standard Oil control of it, Archbold assured Rockefeller in a private letter: "You know we have no control whatever of that paper."[14] In contrast to the relative restraint of Young, Boyle converted the *Derrick* into a verbose, vociferous supporter of the oil combination. He never found anything wrong with the behavior

of any Standard Oil official and was always violently critical of its opposition. He was factually more accurate than the *World*, but hardly more balanced, although apparently always thoroughly convinced of the validity of his contentions. Whatever his relationship to Standard Oil, be it only his close friendship with another Irishman, Daniel O'Day, Boyle was soon recognized as Standard Oil's spokesman throughout the Oil Regions and beyond.

When the policies of prominent newspapers conflicted or threatened to conflict with those of Standard Oil, either top managers or their friends tried to learn the facts and to persuade editors and owners to adopt a more "reasonable" course. Benjamin Brewster had no hesitancy in presenting his views on any subject to Whitelaw Reid, owner of the *New York Tribune*. W. P. Thompson felt equally at ease in chatting with Henry Watterson of the *Louisville Courier-Journal* about a wide range of topics, including both the equities and inequities of the proposed bill for regulating interstate commerce in 1887.[15]

Managers at 26 Broadway also kept alert to state and federal legislative proposals deemed inimical to Standard Oil interests. Usually lobbying tactics were defensive in character, though occasionally the executives sought to forward a measure for their own advantage. A few examples must suffice. "I have arranged," wrote J. N. Camden in 1882, "to kill the two bills in Md. legislature at comparatively small expense." O. H. Payne decided not to work against the proposed general pipeline incorporation law in Ohio in 1884, on the ground that such opposition was "likely to result in eventual defeat thereby weakening our position with the Legislature when there are matters of consequence to be considered."[16] As mentioned in the preceding section, lobbying and probable payments to some state senators were used by Standard Oil men to defeat the Billingsley Bill in the Pennsylvania legislature in 1887.

Payments to politicians, which normally took the form of contributions by individual executives to campaign funds, were given with mixed feelings on occasion. "Our friends do feel that we have not received fair treatment from the Republican Party," wrote Rockefeller when sending a thousand dollars personally to that group in Ohio, "but we expect better things in the future."[17]

Standard Oil officials still resorted to one of their most-used techniques to lessen the public accusations by which so many litigants fought their cases against the combination. Having recently experienced the conspiracy trial with the Buffalo Lubricating Oil Company, Limited, they decided to

stop pending legal actions on the part of Lewis Emery, Jr., and two associates by buying them out. In connection with the sale of the business of Logan, Emery & Weaver, including a refinery in Philadelphia and facilities in Pittsburgh, to Standard Oil on November 25, 1887, Emery, W. R. Weaver, and L. E. Hamsher agreed to "surrender, release and discharge each and every claim" they might have, "either in law or equity, either individually or as members of the Emery Oil Company or any other co-partnership or company against the United Pipe Lines, the National Transit Company, The Standard Oil Company of Ohio or any affiliate interest of said corporations."[18] Senator Emery had spoken the truth on April 28 of the same year when he branded as false the allegations of the *Oil City Derrick* and Titusville *Herald* that he had offered to sell the plant of Logan, Emery & Weaver to Standard Oil for $750,000 and his "support." He did not sell the refinery until six months later, may have received less than $750,000, and agreed to discontinue only his *legal* proceedings against Standard Oil units.

In general, Standard Oil's basic policy of withholding key information continued. When Professor M. B. Anderson of the University of Rochester asked Rockefeller for facts substantiating the contention that large-scale application of capital and labor had been responsible for the decline in price and improvement in quality of refined oils in recent years, George H. Vilas stated to Rockefeller his reasons for not giving the data. He said that he was unable to "prove" that the decline in prices was the "necessary effect" of large-scale operations and, moreover, felt that if the data were given to Anderson the result would be "in many suggested inquiries coming back, some of which it might be undesirable to answer." Even more explicit was Paul Babcock in his opposition to the preparation of statistical data for use in the legislative investigations in 1888. "I think this anti-Trust fever is a craze," he wrote to Rockefeller, "which we should meet in a very dignified way & *parry every question* with answers which while perfectly truthful are evasive of *bottom* facts."[19] The old habit of concealment of factual information from competitors died hard in almost all Standard Oil executives.

Nevertheless, during the year 1887 Standard Oil leaders began to show some signs of acknowledging the need to adjust their public relations policies to prevailing conditions. Rockefeller and his associates could not completely ignore the rising blast of public condemnation. Warden probably best expressed the hurt felt by sensitive men in the group. "We are quoted as the representation of all that is evil, hard hearted, oppres-

sive, cruel, (we think unjustly)," he wrote to Rockefeller, "but men look askance at us. We are pointed at with contempt, and while some men flatter us, it's only for our money and we scorn them for it and it leads to a further hardness of heart. . . . None of us would choose such a reputation. We all desire a place in the good will, honor & affection of honorable men."[20]

One measure that tended to lessen criticism by an antagonistic group was Standard Oil's co-operation with Appalachian producers in implementing the highly publicized shutdown movement in 1887.[21] Without the assistance of the combination in granting the profits upon six million barrels of petroleum as compensation to inactive producers, drilling contractors, and laborers, the success of the curtailment would have been impossible. The action of Standard Oil undoubtedly won it friends both inside and outside the Oil Regions.

Noteworthy, too, was the absence of opposition by Standard Oil men in 1887 to the bill for regulating interstate commerce, either before or after its passage. Their reasons were numerous. As early as the compromise agreement with the producers in 1880, top officials had agreed not to oppose "an entire abrogation of the system of rebates, drawbacks and secret rates of freight in the transportation of petroleum on the railroads."[22] By 1887 Standard Oil was receiving few favors from railroads on the transport of crude oil, since almost all of it went through trunk pipelines. As noted in Chapter 7, the effort to get favorable rates on finished products had become a decided trial. Dodd, the influential solicitor of the Trust, had not only opposed discriminatory rates openly but within the combination had used his efforts to get special rates discontinued unless they represented a reasonable allowance for terminal facilities and labor handling the freight.[23]

In 1888 the behavior of Standard Oil officials before the New York Senate and the national House Committee on Manufactures was far more frank, less evasive, and more revealing of the business of the whole Trust than any testimony previously given by members of the combination. As usual, John D. Rockefeller was reticent, but more information about the operation of the Trust was put into the governmental records by Archbold, Flagler, Brewster, O'Day, F. D. Carley, H. L. Davis, Malcolm Lloyd, and others. The Trust Agreement itself was presented to the public for the first time. Various witnesses gave evidence on the Executive and Proxy committees, the number of shareholders in and dividends paid by the Trust, data on competition with Russian petroleum, lists of tank cars, prob-

lems of owning and operating tank cars and pipelines, and other phases of the business of the combination. In fact, the *Oil, Paint & Drug Reporter,* in noting the conduct of Rockefeller and associates before the New York Senate Committee, observed: "This frankness and these results were equally surprising to those who knew of the Standard only by the clamor of the press, while to these disappointed papers they were almost crushing." Members of the Executive Committee thought the report of the House Committee on Manufactures had "pretty fairly stated the Trust position."[24] For the first time Standard Oil had been given an opportunity to present its case comprehensively.

S. C. T. Dodd had compiled more data than either he or other witnesses were able to give in testimony, and the information was published in the most notable of his numerous articles and pamphlets: *Combinations: Their Uses and Abuses, with a History of the Standard Oil Trust.* It appeared in 1888. He inaugurated his essay by defending the right of combination and criticizing those who saw nothing but evil in it. To him it was a great mistake to invest "combination" and "monopoly" with identical meanings. Dodd wrote:

> There is, in fact, no necessary relation between them. The wonderful success of modern business is dependent upon combination. It is as much a necessity of trade and commerce as steam and machinery. By combination capital is obtained, enterprises of magnitude conducted, great results accomplished. By combination small capital can successfully compete with large capital. Every partnership is a combination. Every corporation is a combination. Destroy the right to combine and business on a large scale becomes at once impossible. Unity of action would be destroyed. Our railroads would be eaten by rust. Our ships would rot in their harbors. Our warehouses would decay. Mankind would become segregated as savages, each acting for himself alone and endeavoring to destroy others. Surely people do not stop to think what they mean when they utter their wild cries against combinations.
>
> Possibly some combinations are monopolies, but monopoly does not necessarily arise from combination. A monopoly can be held by a single person as well as by a combination of many persons.

"Combination is a power for good," Dodd insisted. "It may also be a power for evil. The power must not be destroyed; it must be regulated." He maintained that freedom of combination rendered monopoly impossible. "Competition crushes out competitors but does not destroy competition so long as all have the right to compete," said Dodd.

After upholding "good" combinations per se, the able attorney went on to defend the Standard Oil record. The Trust was not a monopoly, he

contended, because it had strong competition and new companies were continually entering the oil business. Then, using facts and figures to substantiate his points, he maintained that the Trust had been a great boon to the oil industry and to the people of the United States: it had cheapened both local and long-distance transportation of crude oil by "perfecting and extending the pipeline system"; it had manufactured "a better quality of illuminating oil at less expense by uniting the knowledge, experience and skill" of all participants in the combination; it had reduced costs of manufacturing and packaging by making its own barrels, tin cans, boxes, paint, glue, and acid by mass-production methods utilizing the latest machinery; it had through experimentation and utilization of the best skills available developed useful by-products from petroleum and had cheapened illuminating oils for the public by taking some of its profits on the by-products; and it had employed the least expensive means of distributing petroleum products throughout the markets of the world. All told, he made an ardent case for his employer. Though Dodd did not command an audience even remotely so large as that of the hostile press, his pamphlet was widely read.

During the late eighties officials among the Standard Oil group began to show more appreciation of the power of the press and to attempt to utilize it. Dodd was frequently called upon for comments in connection with reports circulating in the newspapers, which he often denied categorically. E. T. Bedford usually made a good impression on reporters. He was genial and frank—up to a point; if rumor was correct that Standard Oil was making an agreement with the paraffin-wax producers and candle manufacturers in the United Kingdom, he admitted it and gave the general nature of the agreement, though not the details.[25] When attacks on the Trust at Chautauqua by Dr. Washington Gladden, the Congregational minister famed for his condemnation of combinations, began to appear in the newspapers, Standard Oil officials engaged George Gunton to debate him publicly. Gunton was an English-born humanitarian, former labor leader, writer on economic topics, and ardent supporter of combination by both capital and labor. His relations with Standard Oil are discussed in later chapters.[26]

During these years the apostle of silence himself, John D. Rockefeller, began to turn a more favorable face to the press than he had turned earlier. In connection with the decision against the Everests in the Buffalo Lubricating Oil case, he made a strong and critical statement to the *New York Tribune*. Two years later, 1889, when *Harper's Weekly* decided to

include some Standard Oil executives in a series on "Men Who Control Millions," James McGee and John D. Archbold sent information to the periodical, and Rockefeller took occasion to insist that the success of the combination should be attributed to the entire team of managers. "I would not like anything written that shall have me stand out without recognizing my associates, for of course I do recognize that the success has come of our united effort," he wrote in a memorandum.[27] On March 29 of that year Rockefeller even granted an interview to a reporter of the New York *World.* Assisted by a memorandum by Dodd, the quiet-spoken leader of the Trust gave a comprehensive defense of its operations, including answers to charges of coercion and monopoly.[28]

All these measures proved to have been too little and too late, as Rockefeller and his associates may well have anticipated. On May 8, 1890, a *quo warranto* petition was filed in the Supreme Court of Ohio for the case entitled: "The State of Ohio on the Relation of David K. Watson, attorney-general, Plaintiff, against the Standard Oil Company, Defendant." The attorney general, assisted by John W. Warrington, a lawyer from Cincinnati, contended in his pleading of the case that The Standard Oil Company (Ohio) had transferred its stock to the Trustees of the Standard Oil Trust after January 2, 1882, that they had controlled the management of the Ohio Company through choice of directors, that by acquiescing in these actions and submitting to dominance by an agency unknown to Ohio law, the company had forfeited its rights, powers, privileges, and franchises, and that through association with the Trust, a monopoly, it had violated the public interest. Watson's point of departure was the common law.

The pleading of the defense lawyers—Dodd, Virgil P. Kline of Ohio Standard, and Joseph H. Choate of the New York bar—denied the allegations of the state on narrow legal grounds. They contended that the corporation was a separate legal entity, that its shares had been transferred to the Trustees by the stockholders, not by the company, and that Ohio Standard was controlled by the majority holders of the stock, albeit they were actually the Trustees of the Standard Oil Trust. As a precaution, the defense added that, should the signing of the Trust Agreement by the individual stockholders be considered reason for forfeiture of the charter, the statute of limitations would prohibit such action in view of the fact that more than five years had elapsed after the formation of the Trust before the attorney general had filed his petition.

Speaking through Judge T. A. Minshall, the court handed down its

decision on March 2, 1892.[29] It brushed aside the distinction between the stockholders and the company. As a result of the agreement transferring the shares to the Trustees, said the judge, Ohio Standard was effectually, though indirectly, controlled and managed by the Standard Oil Trust. "Its object," he continued, "was to establish a virtual monopoly of the business of producing petroleum, and of manufacturing, refining and dealing in it and all its products, throughout the entire country, and by which it might not merely control the production, but the price, at its pleasure. All such associations are contrary to the policy of our state and void." The decision forbade Ohio Standard to maintain the Trust Agreement, to assent to further transfer of stock, or to permit the Trustees further to control its affairs. Though the statute of limitations was recognized and the charter was not forfeited, Ohio Standard was assessed the costs of the suit. The voice of public conviction had spoken. A new problem of adjustment faced Standard Oil officials.

REORGANIZATION OF STANDARD OIL; JERSEY STANDARD ACQUIRES DUAL FUNCTIONS

Following the decision of the Supreme Court of Ohio, Standard Oil's executives arranged to continue their combination as a community of interest in which Jersey Standard was assigned a leading corporate role. Rockefeller and his associates instituted proceedings to dissolve the Trust, regrouped their holdings in a few companies through mergers and stock purchases, and as stockholders entrusted managerial functions to a small group of executives. They referred to the loose, unofficial union of companies as the "Standard Oil Interests."

Within three weeks after the court decision prohibiting the voting of Ohio Standard's shares by the Trust, top management took steps to reorganize the Standard Oil combination.[30] After getting permission to take a longer time than originally granted for the necessary changes, the Trustees announced on March 10, 1892, through S. C. T. Dodd that they had decided to dissolve the Trust. At a formal meeting eleven days later holders of more than two-thirds of the certificates ratified the Trustees' decision.

Several considerations dictated that action. The ruling of the Supreme Court of the State of Ohio precluded further participation of Ohio Standard in the Trust. Had the Trustees not decided upon dissolution, the attorney general of New York was prepared to bring suit against the Standard Oil Company incorporated in that state. The provisions of the

Table 21 THE TWENTY COMPANIES IN THE "STANDARD OIL INTERESTS," WITH AFFILIATES AND PROPERTIES TRANSFERRED, DECEMBER 31, 1892[a]

Twenty Companies and Their Affiliates	*Capitalization of Major Companies*	*Percentages Held in Affiliates*
ANGLO-AMERICAN OIL CO., LTD.	$2,530,667	
Canadian companies		
Bushnell Co., Ltd., The		99.4
Eastern Oil Co.		65.0
English companies		
Bayonne Steamship Co., Ltd.		99.5
Manhattan Steamship Co., Ltd.		99.5
Weehawken Steamship Co., Ltd.		99.5
European companies		
American Petroleum Co.		51.0
Aktien Gesellschaft Atlantic		60.0
Det Danske Petroleums-Aktieselskab		30.0
Deutsch-Amerikanische Petroleums-Gesellschaft		38.4
Società Italo-Americana pel Petrolio		60.0
United States companies		
National Storage Co.		99.9
Tide-Water Pipe Co., Ltd., The		31.1
United Refiners Export Oil Co., The		100.0
Western & Atlantic Pipe Lines, The		45.0
ATLANTIC REFINING CO., THE	5,000,000	
Companies Absorbed		
Acme Oil Co. (Pennsylvania)		
Eclipse Lubricating Oil Co., Ltd.		
Electric Light Oil Co., The		
Globe Refining Co. (Pittsburgh)		
Imperial Refining Co., Ltd.		
Standard Oil Co. (Pennsylvania)		
BUCKEYE PIPE LINE CO., THE	10,000,000	
Companies Absorbed		
Connecting Pipe Line Co.		
Cygnet Pipe Line Co., The		
Macksburg Pipe Line Co.		
EUREKA PIPE LINE CO., THE	5,000,000	
FOREST OIL CO.	5,500,000	
Commercial Natural Gas Co.		100.0
Lawrence Natural Gas Co.		100.0
Mahoning Gas Fuel Co., The		100.0
Producers' Consolidated Land & Petroleum Co.		67.6
Taylorstown Natural Gas Co.[b]		30.0
Washington Oil Co.		71.5
INDIANA PIPE LINE CO.	1,000,000	

Table 21 (Continued)

Twenty Companies and Their Affiliates	*Capitalization of Major Companies*	*Percentages Held in Affiliates*
NATIONAL TRANSIT CO.	$25,455,200	
Eagle Consolidated Refining Co.		100.0
Erie City Gas Fuel Co.		100.0
Excelsior Pipe Line Co.		100.0
Franklin Pipe Co., Ltd.		39.0
South-West Pennsylvania Pipe Lines		100.0
NEW YORK TRANSIT CO.[c]	5,000,000	
NORTHERN PIPE LINE CO.	1,000,000	
NORTH WESTERN OHIO NATURAL GAS CO.	5,550,500	
OHIO OIL CO., THE	2,000,000	
Company Absorbed		
Jackson Oil Co.		
SOLAR REFINING CO., THE	500,000	
SOUTHERN PIPE LINE CO.	5,000,000	
SOUTH PENN OIL CO.	2,500,000	
Marion Oil Co.		50.0
Mountain State Gas Co., The		100.0
Companies Absorbed		
Midland Oil Co.		
North Penn Oil Co.		
Union Oil Co.		
STANDARD OIL CO. (INDIANA)[d]	1,000,000	
Companies Absorbed		
Chester Oil Co. (Minneapolis)		
Globe Oil Co. (Minneapolis)		
Standard Oil Co. (Illinois)		
Standard Oil Co. (Minnesota)		
STANDARD OIL CO. (KENTUCKY)	1,000,000	
Monarch Oil Co.		100.0
White's Golden Lubricator Co.		100.0
Companies Absorbed		
Consolidated Tank Line Co.		
Des Moines Oil Tank Line Co.		
STANDARD OIL CO. (NEW JERSEY)	10,000,000	
Bush & Denslow Mfg. Co.		50.0
Capital City Oil Co.		74.8
Central Refining Co., Ltd.		66.7
Chesebrough Mfg. Co., Cons.		55.5
Continental Oil Co.		68.7
Empire Refining Co., Ltd.		78.5
Galena Oil Works, Ltd.		86.3
Gilbert & Barker Mfg. Co.		76.5
Inland Oil Co.		100.0
Liebig Manufacturing Co., The		52.4
New Jersey Oil Co.		99.3

Table 21 (Continued)

Twenty Companies and Their Affiliates	*Capitalization of Major Companies*	*Percentages Held in Affiliates*
STANDARD OIL CO. (NEW JERSEY)—*Cont.*		
Rasin Fertilizer Co., The		14.9
Signal Oil Works, Ltd.		38.8
Standard Oil Co. (Iowa)		100.0
Swan & Finch Co.		74.7
Underhay Oil Co.		99.4
United Gas Improvement Co.		0.7
Vacuum Oil Co.		75.5
Waters-Pierce Oil Co.		60.7
West India Oil Refining Co., The		50.0
West Virginia Oil Co.		47.5
Companies Absorbed		
Baltimore United Oil Co.		
Bergenport Chemical Co., The		
Camden Consolidated Oil Co.		
Eagle Oil Co.		
STANDARD OIL CO. OF NEW YORK	$7,000,000	
Companies Absorbed		
Acme Oil Co. (New York)		
American Wick Mfg. Co.		
Atlas Refining Co.		
Devoe Mfg. Co.		
Maverick Oil Co.		
Mehlen's Family Oil Co.		
Oswego Mfg. Co.		
Portland Kerosene Oil Co.		
Pratt Mfg. Co.		
Sone & Fleming Mfg. Co., Ltd., The		
Thompson & Bedford Co., Ltd.		
STANDARD OIL CO. (OHIO), THE[d]	3,500,000	
Company Absorbed		
L. D. Mix Oil & Naphtha Co.		
UNION TANK LINE CO.	3,500,000	
Total	$102,036,367	

[a] Stocks in all the companies listed were either directly held by the Trust or were already held by one of the twenty major companies on December 31, 1891, with a few exceptions. New York Transit was newly incorporated. Shares in the Det Danske were acquired in March, 1892, and the Commercial Natural Gas and Mountain State Gas were organized in 1892. All the companies whose properties were acquired from other parts of the Trust were liquidated.

[b] The other 70% of Taylorstown Natural Gas Co. was held by Washington Oil Co.

[c] New York Transit Co. took over the property of National Transit in the state of New York.

[d] Both Indiana Standard and Ohio Standard had small investments in other companies.

Source: SONJ, Consol. Accts. of S. O. Trust, Dec. 31, 1891, Consol. Accts. of Standard Oil Interests, Dec. 31, 1892, and accounts of various companies; Taylor, "History," 81-398, *passim*; *U. S.* v. *SONJ*, VIII, 1012-1015.

Sherman Antitrust Act pointed to the imminent probability of federal litigation designed to break up the Standard Oil combination.

Arrangements had to be made in a hurry. The Ohio Court stipulated that the Trustees could not vote the shares held by them in the Ohio Standard after four months.

A double course of action was immediately laid down. The Standard Oil executives decided to simplify their organization by reducing the number of basic components of the combination from the ninety-two companies as of the end of 1891, to twenty as of April 1, 1892. The reorganization was accomplished by some of the corporations' buying the properties of sister companies and by their purchasing of stocks in others. (See Table 21.) Secondly, the actual dissolution of the Trust was to be achieved by distributing the shares of each of the twenty companies to owners of certificates in the Trust in proportion to their holdings in it. John D. Rockefeller owned 256,854 shares out of the 972,500 issued by the Trustees up to April 1, 1892; hence, he was entitled to 256,854/972,500ths of the shares held by the Trust in each of the twenty companies.[31]

The eight liquidating trustees—John D. and William Rockefeller, Flagler, Archbold, Brewster, Rogers, O. B. Jennings, and W. H. Tilford—immediately faced and solved a problem presented by the simultaneity of the reorganization into twenty companies and the surrender of the certificates by the holders. Changes had to be made in several of the selected large companies, and one new one—the New York Transit Company—had to be organized. Shares in the twenty corporations could not be issued at once to those stockholders in the Trust who turned in their certificates before the preliminary moves were completed. To assure the stockholders of their rights and to facilitate the surrender of Trust certificates, the liquidating trustees prepared to issue to each holder of a certificate in the Trust an assignment of legal title to his or her equity in the stock of each of the twenty companies. In exchange for that assignment each certificate holder was expected to turn in a certificate for cancellation, and later to exchange the document in hand for stock in the twenty companies.

Several changes were made in Jersey Standard at the time to prepare it to play a new role. (1) Its charter was broadened sufficiently to give the corporation power to carry on, without any qualification, all operations in the oil business. (2) Its capitalization was raised from \$3,000,000 to \$10,000,000 and the new stock issued. This made Jersey Standard's capitalization equal to that of The Buckeye Pipe Line Company and, in the

list of twenty companies, second only to that of the National Transit's over $25,000,000. (3) The name was changed from "Standard Oil Company of New Jersey" to just "Standard Oil Company." Henceforward, the title had to be written "Standard Oil Company (New Jersey)" in order to distinguish it from corporations bearing the same name but chartered by other states. (4) Commensurate with its enlarged responsibility, Jersey Standard's board of directors was increased to nine,[32] and several prominent Standard Oil leaders were included among its directors for the first time. (See Table 22.)

Table 22 LIST OF DIRECTORS AND OFFICERS OF STANDARD OIL COMPANY (NEW JERSEY), 1892 TO 1899

Directors	*Officers*	
J. H. Alexander[a]	President	H. M. Flagler
J. D. Archbold	Vice-President	J. H. Alexander
Paul Babcock, Jr.[a]		Paul Babcock, Jr.
Charles C. Burke	Secretary	L. D. Clarke
H. M. Flagler[a]	Treasurer	William T. Wardwell
H. H. Rogers		
J. D. Rockefeller[b]		
William Rockefeller		
W. H. Tilford		

[a] Flagler had served as president and director from 1882 to 1883. Except for Alexander and Babcock, all the other members were elected to the board of directors for the first time. For earlier officers and directors, see Table 3.
[b] J. D. Rockefeller was elected in 1893 to replace T. C. Bushnell.
Source: SONJ Minute Bk.

The enlarged Jersey Standard became one of the leading operating units in the Standard Oil combination. With 22,600 out of 70,000 new shares, the Standard Oil Company (New Jersey) purchased all the properties of four members of the Standard Oil group—the Baltimore United Oil Company, the Camden Consolidated Oil Company, the Eagle Oil Company, and The Bergenport Chemical Company—and the four corporations were liquidated. The first three companies were acquired from the Trustees of the Standard Oil Trust, the fourth from the Pratt Manufacturing Company, which itself was absorbed by New York Standard at this time. By these purchases the Jersey Company added several manufacturing establishments—a refinery at Baltimore, an acid manufacturing plant near Bayonne, a lubricating oil works at Parkersburg, West Virginia, and another one at Communipaw, New Jersey, which it had held from 1882 to 1883 before the organization of the Eagle Oil Company.

Furthermore, its marketing facilities were increased by the addition of bulk stations and tank wagons in states from Maryland to South Carolina.

At the same time Jersey Standard became a holding company. This change was possible because of alterations that had been made in the law of the state of its domicile in 1889. In the first exercise of the new function, Jersey Standard exchanged 36,100 shares for all the investments of the Trust in nineteen companies. Stock in Gilbert & Barker was also purchased from Pratt Manufacturing Company and in Swan & Finch from Thompson & Bedford Company, Limited, which itself became a department in New York Standard. (See Table 21.) Included in Jersey Standard's holdings were stocks in corporations doing business from coast to coast. The large marketing companies for the Far West and Southwest—Iowa Standard, Continental, and Waters-Pierce—became Jersey Standard's affiliates. Also important were the specialists in manufacturing and sales of lubricants—Galena, Signal, Vacuum, Inland, Swan & Finch, and Underhay. All its other newly acquired shares, except those in a small marketing unit, the New Jersey Oil Company, were in manufacturing and refining companies in which outsiders constituted either a major or minor interest. The addition of all these holdings to Jersey Standard was not an enlargement of the Standard Oil group but merely a transfer from one part of it to another. For Jersey Standard, as a corporation, the change was significant in making it the recipient of profits from the large marketing area west of the Mississippi and from the extremely remunerative manufacture of lubricants and specialties. On its board Charles C. Burke, with years of experience at the Eagle Works, was the expert in lubricants, and W. H. Tilford in domestic marketing.

In addition to Jersey Standard, several other corporations among the twenty assumed or continued holding-company functions. The most important was the Anglo-American Oil Company, Limited, which already owned three shipping companies. It acquired the stocks held by the Trust in all the foreign marketing companies, plus those in four corporations within the United States. (See Table 21.) The only significant new acquisition by the National Transit Company was the South-West Pennsylvania Pipe Lines. The holdings of Forest Oil and South Penn fell into two categories: producing companies in which Standard Oil interests had less than outright ownership, and companies designed to take over natural gas properties developed in connection with drilling for petroleum. Some of the twenty companies and their subsidiaries also had small participations in local marketing concerns.

Nine of the nineteen major components of the Standard Oil interests, not counting Jersey Standard, also acquired physical properties from former associates. (See Table 21.) The Atlantic Refining Company took over all manufacturing (except the Galena and Signal works) and marketing facilities in Pennsylvania, Delaware, and southern New Jersey. Through purchases the Standard Oil Company of New York assumed ownership of all refining, auxiliary manufacturing, and marketing operations of the combination in New York and New England, except for the Bush & Denslow Refinery in Brooklyn and the Underhay Oil Company (a marketer of lubricants in Boston), both of which became affiliates of Jersey Standard. The one new incorporation, the New York Transit Company, was vested with all the properties of the National Transit in New York State. By purchasing properties of three companies The Buckeye Pipe Line Company became the sole owner of the Trust's former gathering systems in Ohio and Indiana and all of the trunk lines in Ohio except that from Cleveland to the Pennsylvania border retained by the National Transit Company. The Ohio Oil Company emerged as the sole Standard Oil producer in the Lima-Indiana field, and South Penn vastly increased its operations in Pennsylvania. For the first time Indiana Standard went into wholesale marketing beyond direct sales to industrial users; its new properties gave it coverage of marketing to retailers in northern Illinois, northern Iowa, Minnesota, Wisconsin, the Dakotas, and Canada from Lake Superior to the Rocky Mountains. After April 1, 1892, the sales territory of Kentucky Standard, already large, was greatly increased; its area of operations extended from Florida and Georgia to the Mississippi River and from the Gulf of Mexico to southern Indiana, Ohio, and Illinois, not to mention northern Missouri, southern Iowa, Kansas, Nebraska, and southern South Dakota.

While the foregoing transfers were in process of being effected, the dissolution of the Standard Oil Trust had reached an impasse. By the end of 1892 seventeen stockholders from ten families—the two Rockefellers, Archbold, Tilford, Rogers, Flagler, C. W. Harkness, O. H. Payne, Estate of Charles Pratt, Benjamin Brewster and family, and O. B. Jennings and his family—had turned in certificates representing 494,619 shares for cancellation, but hundreds of holders of the remaining 477,881 shares refused to release them to the liquidating trustees. In the case of the Standard Oil Company of New York, the seventeen large holders of Trust certificates exchanged them for 35,593 shares out of the total of 70,000 outstanding, and six directors held one share each. This left 34,388 in the hands of

the Trust and the remaining thirteen in the form of fractional shares or scrip. In spite of the elaborate plans for dissolution, the operation made no further progress prior to December, 1897. The last certificate to come in for cancellation, one belonging to the estate of George Rice, appeared in November, 1911![33]

The holders of smaller amounts of Trust certificates refused to exchange them for shares in the twenty companies because of potential loss upon the investment. Trading had never taken place in anything but Trust certificates, each of which represented an investment in all constituent companies operating as an entity. No one knew the value of the shares of the twenty companies, since they had never appeared in the market. Moreover, an owner of only a few Trust certificates would receive nothing but scrip. For example, for a single Trust certificate, he would be given 1/972,500 of the shares held by the Trust in each company. Fractional shares in the companies had value only to other holders of similar scrip, and no dividends were paid on them. The liquidating trustees had no power to compel the nearly 1,600 small investors to risk the loss inherent in the dissolution arrangement.

Though the executives had started to liquidate the Trust itself, the combination remained intact. The stockholders retained their common concern with the operation of all the companies in the Standard Oil group as one unit, symbolized in the heading of "Standard Oil Interests" in the Consolidated Accounts from 1892 to 1899. Every company was indeed legally directed by its own directors, but most of the major directorships and presidencies were held by men who had been on the Executive Committee of the Trust. Policy formulation continued to be exercised by this group of top executives, with the aid of experts who were, in fact, the efficient committees developed during the previous decade but undergoing a legal change in name to conform to the dissolution of the Trust.

Owner-control rested in the seventeen stockholders who had exchanged Trust certificates for shares in the twenty companies. One indication of their position was representation on the board of liquidating trustees, though it was not in that capacity but as voters of stock, and in some cases as directors in the twenty separate companies, that they exercised authority. Members of all the ten families included among these seventeen stockholders were elected to the board of liquidating trustees at one time or another between 1892 and 1899. John D. Rockefeller, William Rockefeller, Flagler, Archbold, Rogers, and W. H. Tilford were members throughout the period. Two of the original board members died—O. B.

Jennings in 1893 and Benjamin Brewster in 1897. They were replaced in the latter year by Oliver H. Payne, Charles W. Harkness, and Charles M. Pratt, an action which gave representation to the three families among the ten not previously included in the list of liquidating trustees.

As majority owners of stock in the twenty companies, the same group exercised control through election of directors to the twenty companies. Archbold put the situation pithily in testimony during 1899: "The ownership . . . naturally brought them [the companies] into harmony of action."[34]

The directorships and presidencies of the twenty companies were held by a small group of men. Several changes were made so that most of the presidents were men located in New York.[35] John D. Rockefeller retained the presidency of Ohio Standard and his brother William that of New York Standard. Flagler replaced Babcock as head of the enlarged Jersey Standard, and W. H. Tilford took over the executive leadership of Indiana Standard and the Union Tank Line Company. James McGee became president of Atlantic Refining. On McGee's death in 1898, F. Q. Barstow succeeded to the post; he had for many years been consulted by Archbold on important issues. Two men held eleven of the remaining presidencies —Archbold of Solar Refining and three major producing corporations, and Rogers of seven pipeline units, including the largest capitalized company in the organization, National Transit. Among the presidents in 1895 only the veteran Alexander McDonald of Kentucky Standard and Daniel O'Day of North Western Ohio Natural Gas were not within the inner top circle of men who had been on the Executive Committee of the Trust. None of the select group served on the board of Anglo-American during the period, but its membership included T. C. Bushnell, who had headed the Export Trade Committee, and several others of that group. The interlocking nature of the directorships is shown in Table 23.

In some cases official titles convey a misleading impression as to actual active participation in leadership of the Standard Oil Interests. John D. Rockefeller began to suffer from digestive troubles and was seriously ill in 1891. From that time he began, to use his own words, to "taper off" his relation with the oil business. Within four years he had ceased going regularly to 26 Broadway and had practically dropped all interest in Standard Oil except as a large investor. While yet only in his middle fifties, Rockefeller retired from business and entrusted the active management of all his interests to others. As he explained to a son-in-law later: "I turned away from business to other pursuits with the same earnestness

Table 23 PRESIDENTS AND DIRECTORS OF THE TWENTY COMPANIES[a] IN THE "STANDARD OIL INTERESTS," 1895

	Atlantic Refining Co., The	Buckeye Pipe Line Co., The	Eureka Pipe Line Co., The	Forest Oil Co.	Indiana Pipe Line Co.	National Transit Co.	New York Transit Co.	Northern Pipe Line Co.	North Western Ohio Natural Gas Co.	Ohio Oil Co., The	Solar Refining Co., The	Southern Pipe Line Co.	South Penn Oil Co.	Standard Oil Co. (Indiana)	Standard Oil Co. (Kentucky)	Standard Oil Co. (New Jersey)	Standard Oil Co. of New York	Standard Oil Co. (Ohio), The	Union Tank Line Co.
Archbold, John D.	x			Px	x	x	x	x		Px	Px	x	Px	x	x	x	x		
Babcock, Paul, Jr.																x	x		
Barstow, F. Q.	x													x					x
Bushnell, John							x	x				x							
Clark, N. F.				x									x						
Flagler, H. M.						x	x	x				x		x	x	Px	x		
Fleming, William				x				x	x	x		x	x						
Leslie, D. E.		x							x										
Lloyd, Malcolm	x					x													
McDonald, Alexander															Px				
McGee, James	Px																		
McGregor, Ambrose											x			x			x	x	
Moffett, James														x					
O'Day, Daniel		x	x	x	x	x	x	x	Px			x	x						
Payne, C. N.			x					x	x			x	x						
Pratt, C. M.															x		x		
Rockefeller, J. D.														x		x	x	Px	
Rockefeller, W.					x	x	x	x				x			x	x	Px		
Rogers, H. H.	x	Px	Px		Px	Px	Px	Px				Px	x	x	x	x	x		
Seep, Joseph				x				x				x	x						
Severance, L. H.		x							x		x							x	
Squire, F. B.		x																x	
Strong, E.									x				x						
Tilford, W. H.	x													Px	x	x	x		Px
Young, W. J.				x									x						

P = president; x = director.

[a] Anglo-American Oil Co., Ltd., is omitted from the chart since none of its directors served on any of the other boards. For 1895 they were F. E. Bliss, James McDonald, J. H. Usmar, T. C. Bushnell, G. F. Gregory, C. F. Ackermann, and A. J. Pouch. The first three served as managing directors; the other four were experts in New York on exports.

With the exception of Moffett, directors are not included on the chart unless they served on at least two boards. The other directors for 1895 are included in Note 35 of this chapter.

Source: SONJ, Corp. Recs.; *U.S.* v. *SONJ*, XIX, 666-670.

that I had all my life before devoted to business, and have not sought to keep in touch, but rather to be free and take my recreation and rest, after all the long years of hard service."[36] He was consulted by the active top Standard Oil executives but seldom attended directors' meetings, or even visited 26 Broadway, and did not provide actual leadership.

After John D. Rockefeller's withdrawal, active management of Standard Oil affairs devolved upon men who possessed far less than a majority of the stock in the twenty companies. As already mentioned, other sizable investors had already reduced their active participation in management. The leading administrators, however, retained the complete confidence of the majority stockholders.

During the years 1891-1895 the mantle of John D. Rockefeller as captain of the Standard Oil managerial team gradually descended around the capable shoulders of John D. Archbold. Among the owner-managers only he and Tilford devoted all their time and attention to the business of the Standard Oil interests. Strong supporter of the Methodist Church, benefactor of Syracuse University, and addicted to whistling "Onward Christian Soldiers" in the morning as he went down the corridor to his office, Archbold combined a genial kindliness and inspirational leadership with a calculating shrewdness and wide knowledge of the oil business. As early as 1884 a *New York Tribune* reporter portrayed him with Rockefeller as a master spirit of the combination, Archbold being the one who attended "to the details of this huge company," which had "hardly a parallel on the globe for breadth of conception and infinitude of particulars."[37] Well-versed in the transportation, refining, and marketing of petroleum from experience dating back to the 1860's, Archbold also had become the top figure in Standard Oil producing activities by 1890. No more of a reformer in business and politics than his associates and competitors, Archbold frankly played the game according to the rules he had learned through experience. Critical of him on that score, the public failed to perceive the abilities and contributions of the man who was the actual key figure in the affairs of the group from 1896 to 1911. Archbold needed to be able to inspire men to work loyally for Standard Oil all over the world, just as John D. Rockefeller had done in earlier years. More immediately important was the necessity of patiently reconciling conflicting views held by men in the top group of executives, all vigorous personalities and continually dealing with controversial issues.

When several of the five actual top policy makers of the years 1892 to 1899—Archbold, William Rockefeller, Rogers, Flagler, and Tilford—attended a board meeting, one could almost imagine the frank and joke-

loving Archbold inquiring, "Which board of directors are we today?" O'Day would be present if those guiding pipeline interests were meeting. When William Fleming came to 26 Broadway, production would be the topic of discussion. If refining was to be the subject, the meeting would be attended by McGee, Babcock, or McGregor.

Since the presidents were either in New York or inactive, the vice-presidents played significant roles in local management. Important though Flagler remained in top decision making, his interests in Florida increasingly called him away for long periods. Babcock and Alexander, both vice-presidents of Jersey Standard and both practical refiners, acted as actual managers. Moffett and Cowan continued their team operation for Indiana Standard. Malcolm Lloyd served Atlantic Refining in the vice-presidency, and Frank Rockefeller continued in this post at Ohio Standard. Since C. M. Pratt, the active head of Kentucky Standard, was rapidly rising to the top level of the Standard Oil group, the other vice-president, E. L. Goodwin, was the field manager. The veteran McGregor, characterized by Jersey Standard's Babcock as "a great strong noble fellow"[38] because of his continued ability to come up with good fresh ideas for refining after more than a quarter of a century in that function, held the office for Solar Refining. O'Day was vice-president for seven pipeline companies, sharing the honor and responsibility in two with C. N. Payne. Seep, Young, and Clark held the title for several producing companies which they managed, and Howard Page had it for Union Tank Line. Archbold added the vice-presidency of the important New York Standard to his list of offices and directorships. The rating of Babcock, McGregor, Barstow, and T. C. Bushnell is indicated by their inclusion in 1899, with the nine leading owners of stock, on the Big Board of Jersey Standard.

The formal committee system of the Trust was officially abandoned, but the practice of decision making by consultation and agreement was unofficially retained. On March 24, 1892, just before the termination of the Trust as a functioning organism, Dodd advised Rockefeller that the "so-called Executive Committee has no reason now for its existence."[39] His proposal that the men who had made up the Executive Committee should become presidents of the various corporations and be at 26 Broadway in close contact with each other was carried out as far as possible. Letters no longer referred to the Executive Committee but to the "gentlemen upstairs," and after some floors had been added to 26 Broadway in 1895, to the "gentlemen in Room 1400."[40] That "room" was a series of offices connected by a corridor.

The galaxy of advisory committees continued to perform their respective

functions under changes in name. Each of the constituent companies revoked all powers given to the committees of the Trust, but the companies appointed manufacturing experts and sales agents, often identical with those officially named by other companies. Since almost all were located at 26 Broadway, the designated experts and agents consulted each other on common problems and on recommendations to the "gentlemen in Room 1400." On May 5, 1892, the same day that all committee appointments were revoked by Jersey Standard, the directors of that company named C. M. Pratt and C. M. Coburn as sales agents for refined oil in domestic trade, Silas H. Paine for lubricating oils "in the West," E. T. Bedford for lubricating oils "in the East and for Export," and T. C. Bushnell for refined oils going into the export trade.[41] Because of the peculiar status of the committees, Standard Oil executives truthfully denied their legal existence during subsequent suits. In the course of everyday business the men were designated by their room numbers, but occasionally someone used the earlier name of a committee. For convenience these co-ordinating and advisory units will be referred to in this volume as the committees that they were in fact.

As a result of a concatenation of events dating back twenty years, by 1892 the Standard Oil Company (New Jersey) had risen from relative obscurity to a position of prominence in the Standard Oil family. At that time Rockefeller, Archbold, and their associates were forced to modify the legal form of their institution in response to the pressure of an electorate distrustful of Big Business. In spite of enhanced efforts to defend themselves and their organization against public criticism, in 1892 they had to submit to the dictum of the Ohio Supreme Court that The Standard Oil Company (Ohio) could no longer continue as a participant in the Trust. They immediately initiated the dissolution of that instrument and simultaneously simplified the corporate structure of their multicompanied combination by grouping all their properties in twenty firms. Since a New Jersey law of 1889 permitted a corporation domiciled in that state to hold stocks in other companies, Standard Oil executives not only vested Jersey Standard, among several others, with greatly enlarged operating properties, but also converted it into one of the two leading holding units in the combination. During the next seven years active managers of the Standard Oil community of interests continued to employ proved managerial techniques, including the committee system within a new legal framework, in the direction and co-ordination of their world-wide activities, the subject matter of the next two chapters.

Chapter 9

Global Marketing in the Nineties

For Standard Oil interests abroad the nineties were both a period of reaping earlier gains and a seedtime for new departures. By the time of the corporate reorganization in 1892 much of the volume of the group's exported products was being marketed in Europe by affiliates. In several countries, therefore, the concern of Standard Oil men as investors and as suppliers of petroleum products centered in the expansion and selling techniques of these affiliates. A pressing question was how they should meet their competitors marketing Russian oil. The French market presented a whole series of political and economic factors to which Standard Oil managers must adjust if they wanted success in that nation. What should be done with their small scattered operations in Canada, where a rival, integrated petroleum concern, The Imperial Oil Company, Limited, dominated the scene? Should the South American Continent remain an almost uncharted market for petroleum products? In the Far East the agents of Anglo-American were challenged not only by Russian oil but by the growing production of Java and Sumatra. It was clearly time for Standard Oil men to formulate a broader Oriental policy.

Quite apart from the problems which the reorganization of Standard Oil in 1892 created for its managers, it poses some problems of exact expression for a historian writing about Jersey Standard. No longer was there a central organization such as the Trust, and Jersey Standard did not extend its mantle over foreign affiliates until 1899. These legal facts, however, should not obscure the economic realities. The foreign operations of the Standard Oil Interests, to use the loose inclusive term, were important not only in the nineties and for the following decade, but for a more distant future; they had economic meaning not only for the legal entity under whose name a particular undertaking was inaugurated but for the entire American petroleum industry as well.

The functional organization to market for export was little changed. Legally the Anglo-American Oil Company, Limited, held, with a few exceptions, all the investments earlier made by the Trust in foreign coun-

tries. The Standard Oil Company of New York continued to act as the seller of all Standard Oil products exported from New York and as prime co-ordinator of export sales, although The Atlantic Refining Company sold a growing volume directly from Philadelphia. W. H. Libby, the traveling expert on foreign trade, and other Standard Oil employees went abroad with power of attorney from more than one member of the group, but what they accomplished was important to every corporation in the Standard Oil Interests which produced or refined for export. Libby did not hesitate to refer to the Export Trade Committee by its old name; T. C. Bushnell remained as leader of the group of men composing it; A. J. Pouch, C. F. Ackermann, and Livingston Roe were experts of long standing in foreign trade, and G. F. Gregory was well versed in bulk distribution, especially in tank-wagon operations. These men also served as directors of Anglo-American and some of its affiliates. If anyone remembered Frank Rockefeller's objection to a man serving as representative of both supplier and buyer, it was ignored. As earlier, Thompson & Bedford, now a department within New York Standard, sold through agents abroad the lubricants and wax manufactured by various Standard Oil plants of the combination, including those of Jersey Standard. Some of the latter's newly transferred affiliates, however, notably Vacuum Oil, went their independent ways in expanding marketing facilities abroad.

Sales for export were vital to the Standard Oil Company (New Jersey) as an operating company. In 1899, for example, 74 per cent of the kerosene refined at Bayonne was sold for export.[1] Tankers were quickly filled, and sailing ships were loaded with cased oil at its busy New Jersey wharves. The company's refinery at Baltimore packaged goods for the South American trade. While T. C. Bushnell was no longer one of the directors of Jersey Standard, among its nine was William Rockefeller, top executive in sales for export by right of his position as president of New York Standard.

LEGISLATIVE AND COMPETITIVE OBSTACLES

Actively interested as suppliers of petroleum products to and investors in foreign affiliates, Standard Oil men became increasingly alert to all factors which influenced the implementation of their foreign policies. The growing strength of other American exporters, the rapidly developing production of foreign countries, and multitudinous changes in legislation and regulations affecting the petroleum industry in all parts of the world called for observation and careful evaluation.[2]

The decade was marked in many countries by several unsettling proposals for, and actual changes in, legislation affecting the petroleum trade. Enactment of the laws was undoubtedly influenced by prevailing depression and growth of competition. Tariffs continued high in most nations and, where local production could be appreciably increased, narrowed the market for American products, or, by fostering local refining, changed the nature of the demand. The tariff in the United States was not unrelated to tariffs abroad. In 1894 Congress placed kerosene, on which the rate had been forty cents per gallon until reduced in 1883 to 25 per cent, on the free list, but imposed a countervailing duty of 40 per cent on petroleum and products coming from a country which levied a tariff on similar commodities from the United States; three years later the rate was changed to equal the levy upon American petroleum by the exporting country. Other features of the high Dingley Tariff of 1897 gave rise either to threats or to actual retaliation by other countries; most unsettling were the discussions in Germany, one of the chief foreign markets for Standard Oil products and conveniently close to countries whose export trade would benefit from tariffs discriminatory to Americans. In Italy burdensome local taxes, in addition to a high customs duty, limited sales of petroleum products.

While Standard Oil men kept informed concerning all regulations governing the petroleum trade, some proposals threatened more than minor administrative changes. Several nations modified rules for storage and transportation, but agitation for raising the flash-point test of kerosene was the "burning issue" of the decade in more than one country. Even more unsettling were the discussions over introducing state monopolies of the petroleum trade. When in 1896 Montenegro joined Serbia and Greece in the list of nations with governmental monopolies for the sale of petroleum, the event probably occasioned little worry to the oilmen, but as early as 1891 a similar policy had been agitated in Germany and France and two years later it was under consideration in Italy. For the most part, however, the activities of competing firms, sometimes not entirely disassociated from agitation for legislative changes, occasioned most concern.

The executives of 26 Broadway carefully watched and weighed every change in the Russian petroleum industry. An increasing consumption of residuum for fuel oil kept Russian export kerosene in the favorable competitive position described in Chapter 5. The opening of the Suez Canal to tankers in 1892 proved advantageous to the export of

Russian refined products to the Far East. On the other hand, transportation facilities from Baku to Batum remained unsatisfactory. When export prices of petroleum products fell in the depressed years of the early 1890's, the Baku industry appealed to the government for reduced railroad rates; the request was granted but railroad equipment continued inadequate, and, starting in late 1895, floods interfered with the line's operation. This fact probably hastened the move to provide the long-desired trunk pipeline for products, but the immediate decision was to build it parallel to only 145 miles of the steepest section of the railroad between Baku and Batum. Construction of even this part was delayed while the government's stipulation that all pipe be made in Russia was fulfilled by the importation of a complete pipe mill and skilled laborers from the United States. During the closing years of the century, the potentialities of the projected pipeline and other considerations attracted a substantial flow of foreign capital, largely from England, into the Russian petroleum industry and speeded its development.[3]

Although collaboration among Russian interests waxed and waned, John Archbold considered it a significant feature of the period. As in the United States during the depressed 1870's, conditions in the 1890's encouraged marketers of Russian petroleum to co-operate in various ways. The Minister of Finance, not tempted to any cultural borrowing of American governmental policies toward combinations, encouraged the joint activities. In 1892 the firm of Nobel Brothers was chosen by six other large refiners as the sole agent for marketing in Russia and abroad. Two years later a more comprehensive union was achieved; the Nobels and Rothschilds were constituted the selling agents for about 60 per cent of the export trade, while a second group accounted for another quarter of it. A reorganization of the alliance in March, 1895, placed about 80 per cent of the Russian export trade in the hands of three selling agents, who acted on prices fixed by a committee of fourteen members. Two years later these attempts to work together broke down, a fact attributed by Chambers, who continued as American Consul and Standard Oil's agent in Baku, to the Russian industry's failure to reach an agreement with the Americans. Rising prices and greater prosperity were probably equally important factors in the disintegration of Russian collaborative efforts.

In some ways the decade of the nineties marked the highest point of the Caucasian industry in what two German writers characterized as the thirty years' war with its American counterpart. By 1897 Russia was

producing 45.3 per cent of the world's crude oil and was refining 23.3 per cent of the world's kerosene; the comparable figures for the United States were 48 and 64. The Russian production of crude oil exceeded that of the United States in both 1898 and 1899 and accounted for more than half the world's output in the latter year. Exports of petroleum products from Russia reached a new high.

Several circumstances in the 1890's favored the making of some sort of pact between the American and Russian exporters. Depression in the early part of the decade, intensification of profit-taking competition between their products in some areas, growth of co-operation among the Russian firms, and Standard Oil's dominant place in American exports of petroleum products all favored agreement. Even in the 1880's exporters from Russia, pursuing the European pattern of business collaboration, sought an understanding with Standard Oil. Beginning later in the decade, executives of the American combination carried on protracted negotiations with representatives of Russian petroleum interests. After a talk with Baron Rothschild in 1892, Archbold commented on the latter's courtesy, fluent English, and willingness tentatively to concede the Americans 80 per cent of the volume of the world export trade. The baron apparently was not so well informed about foreign trade as the Americans, who estimated that their position had declined to at most 70 per cent in 1892; and that average was affected by an even greater drop in American imports to several countries.[4]

In spite of repeated rumors to the contrary, no general agreement was ever reached, although, as will appear later, affiliates of Standard Oil did conclude understandings covering individual markets with some sellers of Russian products. In 1894 the New York *World* gave details of the proposed division of the world's markets between the two greatest sellers of petroleum products—the American giant and the combined Nobel-Rothschild group. A better-informed source, the United States Consul General at St. Petersburg, gave the refusal of the Minister of Finance in Russia to confirm the agreement as the cause for the breakdown of negotiations.[5] Whatever the reasons, negotiations were more difficult, and final agreement less likely, than newspaper reporters unfamiliar with the pitfalls of business diplomacy were inclined to think. Late in the nineties, competition between the different groups of Russian exporters alone would have rendered impossible the achievement or maintenance of such a general understanding.

Neither were the American export interests all united, as shown by the

competition in the 1890's between Standard Oil and other American oilmen abroad. During the early part of the decade the companies in which W. L. and H. W. Mellon were large stockholders competed for part of the market of Great Britain and for crude oil sales to France. After 1895, when the refiners of interior Pennsylvania had built pipelines to carry both crude oil and kerosene to near the seaboard and had organized The Pure Oil Company, Limited, the latter created its own marketing outlets in Europe and soon developed keen competition with Standard Oil units in the United Kingdom and on the Continent.

Rivalry in the Far East came from another series of companies. Production in Java and Sumatra had an impact not only on local markets but generally throughout the Far East, and, before the century ended, a significant movement of tankers northward through the Suez Canal was foreshadowed. The far-reaching effect of the developing production in the Far East upon Standard Oil's foreign policy is traced in the last section of this chapter.

STANDARD OIL AND THE FRENCH REFINERS

In seeking to maintain a leading position in the French market for petroleum during the early nineties, Standard Oil executives wandered into a tangled skein of circumstances. Developments in international diplomacy and in the Russian and American petroleum industries, not to mention the ambitions of Standard Oil men and the French refiners, all had to be weighed. The arduous labors of W. H. Libby, Standard Oil's peripatetic plenipotentiary, in France during the months of 1893 provide a case study in the complexities of business diplomacy.[6]

In France the refining industry, aided by differential tariffs on crude petroleum and products, was in the hands of a few well-established families. To some extent their fifteen firms worked together in a syndicate and enjoyed separate regional markets. Through interlocking investors these houses were closely associated with refining in Spain, which was favored by a tariff policy similar to that in France. Some French refiners were also interested in firms in Fiume, which, being a long railroad haul from Galician production, imported raw materials by tank steamers from Batum.

The executives of Standard Oil had several reasons for wanting to modify their policy of selling crude petroleum by contract to individual French refiners. Competition was growing. On July 29, 1892, an American rival, The Crescent Pipe Line Company of the Mellons, concluded a

two-year contract for sales of crude to Fenaille et Despeaux, one of the three leading firms of French refiners. Imports from Russia, which had been small, were increasing. While the growing friendship of the two governments made a French tariff policy preferential to Russian oil a definite possibility, the interest of the Paris house of Rothschild in the petroleum industry of the Caucasus, and the banker's connection with one of the outstanding French refiners, Les Fils de A. Deutsch, made the situation critical. In 1893 the supply contract between the American combination and Deutsch would end. Those responsible for Standard Oil's sales saw that they must act vigorously or they would lose their current share of the French crude petroleum market, which approximated 50 per cent.[7]

Other considerations also motivated the executives' determination to become more active in the French market. The sale of petroleum products was less developed there than in any comparable European country. One American consul believed that the conservatism of the French people accounted for their continued allegiance to candles and lamps burning vegetable oils, but the fact that the price of kerosene was considerably higher in France than in neighboring Belgium and other countries undoubtedly was a factor in the much smaller per capita consumption in the first. Standard Oil men might well have hoped to enlarge sales by modernizing marketing methods in France. In view of the difference in tariffs between crude oil and kerosene, they decided to establish a refining and marketing organization rather than merely a marketing affiliate as in other European countries.

When rumors of this possibility reached the ears of the French refiners in February, 1893, they were very much disturbed. Several of them immediately sought conferences with Libby, who was in Paris under orders from the Executive Committee to consult with the Rothschilds. The talks with individual French refiners, which he had been instructed not to seek but to welcome, gave him the opportunity to indicate Standard Oil's plans for entering more actively into the French petroleum business.

Libby had to pursue a very careful course in dealing with the French refiners. Some members of Les Fils de A. Deutsch were directors in the Rothschilds' Paris "Society" with which general negotiations about the petroleum trade of Europe were in progress. One French refiner, who claimed, Libby wrote, to have "exceptional political influence (they all do), high social position and strong financial connection," declared that Standard Oil would make a mistake if it moved without French allies; the

press and commercial interests would act antagonistically, and the political strength of the French refiners could not be ignored. By others Standard Oil's representative was warned that if his company became active in France the French refiners could divert all their orders for crude oil either to Russia or to the Mellons. The Frenchmen could, in fact, form a coalition with competitors of Standard Oil's pipelines in the United States or finance the construction of their own transportation facilities there. In Libby's opinion he was dealing with "the best organized and most strongly entrenched competitors" Standard Oil had ever met, and the Executive Committeemen must consider that fact in formulating policy for French operations.[8]

By midsummer Libby's talks with the refiners had reached the stage of active negotiations with representatives of the syndicate—hereinafter referred to as the French Refiners—for a general contract to buy crude oil, but discussion of terms, especially of price, dragged on into the winter. Proposals from the French Refiners varied from friendly suggestions to ultimata. Heated conversations characterized the hot July of 1893, and Libby reported a number of "animated interviews" with "agitated" individual refiners, some of whom separately sought special concessions. "To harmonize various discordant interests" Libby found a difficult task; when feelings were "intensely bitter," he employed as "pacifying a manner as possible" and urged compromise upon the Export Trade Committee. "Another deadlock prevailing" was a typical statement in his reports of the autumn. On November 3 he expressed little hope: "As matters look today, the debate is closed and negotiations practically abandoned on both sides. I will only add that I have followed your series of cable instructions to the best of my ability and have sustained every position you have taken by every argument in my power. The task has not been an easy one."[9]

Several occurrences complicated the negotiations. Libby sensed that the arrival in Paris of a representative of the competing Crescent Pipe Line Company in the summer enhanced the stubbornness of the French Refiners, which in turn heightened the desire of Standard Oil executives to buy out their Pennsylvania competitors. In July the French government reduced the tariffs on petroleum and halved the difference between those on kerosene and crude oil;[10] the French Refiners, fearing an increased importation of finished products, hesitated to sign a long contract for raw material. In the early autumn Libby advised 26 Broadway that the Russian industry must not be underrated in the French situation. Various

rumors were circulating: that a French tariff policy preferential to Russia was a possibility, that important Baku interests were holding conferences with French refiners, and that a Russian corporation was considering building a refinery in France.

Though it is not easy even for principals involved in negotiations to assess the factors that determine the ultimate outcome, the formation of Bedford et Compagnie and its activities probably weighed heavily in the eventual conclusion of a supply contract in the name of Standard Oil Company of New York and the French Refiners. To strengthen their own bargaining position and to provide a market for crude oil in France should the agreement not be reached, Standard Oil men had vigorously pushed plans to establish an assured customer in France. With a wary eye on the French tax laws, they took every precaution to keep Bedford et Compagnie, a partnership registered in France on July 15, 1893, legally separate from Standard Oil. Its partners were E. T. Bedford, the specialist in lubricants, and George Southard, an experienced refiner formerly associated with the Atlas Works and The Solar Refining Company. Southard immediately started construction of a modern refinery at Rouen to serve the important northern market, and in the early autumn advertised its forthcoming products. Bedford et Compagnie purchased Raffinerie Française, whose owners, not in agreement with other French refiners, wanted to sell. Holding this corporation added to the arsenal of Bedford et Compagnie a "fair" refinery at La Pallice, near La Rochelle, and excellent port facilities located on a good harbor to serve the west coast. The partners also initiated the construction of a warehouse at Marseilles, the most important port for distributing petroleum products to southern France and other parts of the Mediterranean.

Two other developments undoubtedly contributed to the conclusion of an agreement. To remove American support for the French Refiners, Standard Oil acquired The Crescent Pipe Line Company. The change of ownership was not completed or announced until 1895, but it was foreshadowed by a contract on August 9, 1893, between W. L. and H. W. Mellon and H. H. Rogers. Furthermore, although conversations between representatives of Standard Oil and Russian petroleum interests never resulted in the simple general division of the world market headlined by some American newspapers, the friendly talks with the Rothschilds might well have softened the determination of Standard Oil executives to become a dynamic element in the French market.[11]

Within a few weeks of Libby's most discouraged reports the whole

situation had changed. On November 20 he cabled New York that only details of a contract remained to be settled. On December 2 the preliminary agreement was signed. The final ratification by the fourteen French Refiners, representing virtually the whole industry, was obtained in January, 1894. Even then, an "unprecedented" snowstorm in southern France, by delaying the arrival in Paris of some participants, added the final touch of suspense to the completion of a contract under consideration for many months.

The agreement between Standard Oil and the French Refiners was the result of many compromises but provided what both wanted—the sale of all American crude petroleum requirements in France by the American combination and the control of French refining by the French. The six-year contract stipulated that the Standard Oil Company of New York and its associates would not sell crude oil, distillate, kerosene, or naphtha (lubricants and wax were excluded) to anyone in France except the signatories of the contract; the latter would purchase all their American crude and above-mentioned products from Standard Oil, but the refiners reserved the right to import kerosene from Russia to an amount equal to 20 per cent of their imports from the United States. Bedford et Compagnie was to run no more than 100,000 barrels of crude per year through its refinery at Rouen and a small amount at La Pallice. The output of both plants was to be sold to the French syndicate at cost for distribution to the trade.[12]

Early in 1894 Standard Oil quickly followed the French contract by similar ones with refiners in Spain and Fiume. In Spain the negotiations were simplified by the fact that both Les Fils de A. Deutsch and Desmarais frères, two of the leading French Refiners, were among the most important in Spain, that Fernand Fourcade, former stockholder and now one of the managers of Raffinerie Française, had investments in a refinery in Bilbao, and that no contracts with competitors of Standard Oil were in existence. The refiners in Fiume, where French capital also was important, agreed to buy a stipulated amount of crude oil from Standard Oil for three years.[13]

Carrying out the contract with the French Refiners might be classified as "mere routine management," but it illustrates well the fact that successful operations depended upon almost daily adjustment to pressures inside and outside the combination. Bedford et Compagnie owned refineries in France and operated them for the benefit of the French Refiners, who had signed an agreement with the Standard Oil Company

of New York acting on its own behalf and on behalf of the companies in which it was "interested." Bedford et Compagnie also sold lubricants on commission for the Thompson & Bedford Department, which in turn acted as the exporter for several Standard Oil companies, including Jersey Standard. Intercompany and interdepartmental relations within the Standard Oil group, as well as the relationship between Standard Oil and Bedford et Compagnie and that of the latter with the French Refiners, all had to be worked out in practice.

Through consultation between the Americans and two committees set up by the French Refiners, many differences of opinion were settled.[14] Among these were the questions of who should charter ships to carry petroleum to Bedford et Compagnie, how to fulfill old contracts between the French and Standard Oil's competitors, not all openly admitted in 1893, and who had the right to sell 300° Burning Oil, known as "Mineral Colza Oil." This oil, although a high-grade illuminant, was marketed by the Thompson & Bedford Department and was considered an important contact with the French railroads, which might be won by Russian lubricants. The French Refiners were conceded the right to sell the product, after purchase from Thompson & Bedford.

More disturbing were the differences of opinion over the methods of calculating price. According to the contract, the price f.o.b. New York and Philadelphia was to be cost of crude, taken as the current quotation for National Transit certificates, plus full pipeline rates to the coast. The contract stipulated that should this price ever be higher than the New York Produce Exchange quotation for kerosene of 135° fire test, the inspection requirement in France, Standard Oil was to allow a discount on the crude oil price. Several changes in the industry brought about the need for adjustments. Prices in the wholesale market customarily had been quoted by weight, but, with the increasing use of bulk transportation, refiners asked to buy by measured gallon; one-half the difference between prices calculated by each method was allowed. A major change in Standard Oil's method of purchasing crude in 1895, discussed in the next chapter, led to substituting the combination's posted price for that on the oil exchanges, while the introduction of more than one quotation per day for kerosene on the New York Produce Exchange in 1897 occasioned another minor alteration. The French, dissatisfied with the method of calculating price, asked in 1898 for a discount of twelve cents per barrel. Managers of Standard Oil believed no legal claim existed but granted ten cents per barrel. T. C. Bushnell summed up the feelings of

the members of the Export Trade Committee: "It would seem that as fast as one point is settled they [the French Refiners] are led to raise another. We are of the opinion that we have treated them liberally in all the questions that have been raised."[15] No French comment is available.

The extent to which refinery methods and marketing policy in France were influenced by those in the United States appears to have been very limited. Current information from the United States was available to the former owners of Raffinerie Française who continued to manage it. Bedford et Compagnie built its refinery at Rouen according to the best methods known prior to its opening in July, 1894, and under the terms of the general agreement the French Refiners could examine its operations. How much their techniques were changed is not known. Marketing methods certainly were not modernized; later reports by Americans continued to refer to them as "most extravagant." Water White kerosene and naphtha were sold almost exclusively in small five-liter cans under special brands. Filling, handling, and delivering costs were high. While prices were "fancy" per unit, the volume of business was unsatisfactory by American criteria.[16]

Some of the effects of the contract on the principals were reflected in later evaluations of it. When Libby started to renegotiate the contract in 1899, he declared that the Americans had no share in the profits of ocean transportation, refining, or marketing in France. "Nor have we a voice," he added, "in any manufacturing or marketing policy which, in our judgment, might improve the quality of the finished products and increase the consumption of the same in France, which consumption continues abnormally small." An allowance must be made for Libby's bargaining prose in writing to the French, and he failed to mention that the price of crude petroleum obtained by the Standard Oil group included good profits on pipeline transportation. Libby later described the agreement, under which Standard Oil had sold an average of about two million barrels of crude oil per annum for six years, as being, in his opinion, "profitable and satisfactory to all concerned."[17]

While French refining methods had probably benefited somewhat by information from experienced American refiners, Standard Oil men had done nothing to persuade the French that a larger market with a smaller margin of profit had advantages to consumers and manufacturers alike. Eager to make profits on transporting crude oil, the managers of Standard Oil had accepted the only conditions they could achieve in the economic

and political climate in which they had to operate, but in doing so they had worked no appreciable innovations in the French market. The high prices there soon attracted many competitors.

THE GROWTH OF EUROPEAN AFFILIATES

Standard Oil's trade in other Western European countries was more dynamic than in France. During the years 1892 to 1899 the marketing and shipping companies which Standard Oil had organized with prominent European merchants, and which were soon to be held directly by Jersey Standard, grew in size and strength. They extended bulk methods of distributing petroleum products, while combining with some rivals and working with others, a practice which would have altered the competitive pattern more effectively if other competitors had not arisen.

The management of Standard Oil affiliates during this decade remained essentially the same as before 1892. Anglo-American now held the stock acquired in the Continental affiliates—DAPG, American Petroleum, Det Danske, Italo-Americana, and Aktien Gesellschaft Atlantic. James McDonald, the American managing director of the English house, retained his key position as liaison man between the suppliers in New York and the importing firms in Europe. Standard Oil men were on the boards of directors of the Continental companies, and advice and some few experts went from 26 Broadway to help modernize marketing, but the European founders or successors of the same nationality were the active managers of their companies.

Several considerations undoubtedly supported this policy. Even by the close of the century Standard Oil Interests held no more than 60 per cent of the shares in any of their Continental corporations and less than 50 per cent in two of them.[18] Furthermore, the changed corporate organization of Standard Oil Interests did not favor any move toward greater centralization. Perhaps most important, the knowledge, abilities, and personalities of the European merchants who had helped to organize the companies practically dictated their retention of authority.

Throughout the nineties the European affiliates, in varying degrees, pushed the adoption of methods of bulk transportation and distribution. Although not alone among Europeans in introducing and forwarding these methods, they were able to act more expeditiously than their competitors in most instances. The purchase of the expensive equipment required for the new techniques was financed in part by reinvesting earnings and in part through New York Standard as banker for the Standard Oil

Interests. The Americans exported to Europe not only petroleum but capital to finance the marketing of petroleum products, and, even more important, experts with American "know-how."

Although methods of distributing kerosene, the product which accounted for by far the greatest volume of sales of petroleum products, are used for illustrative purposes, in the 1890's the marketers turned increasing efforts to other products. Techniques of developing sales of naphtha and lubricants are discussed in later chapters. Artificial gas was making inroads on sales of kerosene in Europe, but its manufacture offered a market for gas oil. In 1897 Charles M. Higgins, a special agent for Standard Oil, reported a successful marketing tour of Great Britain. His sales presented the Americans with a new series of technical problems in loading and cleaning tankers to carry gas oil.[19]

In the field of bulk distribution by water the European affiliates needed no advice from America. They assured adequate ocean transportation for their imports by adding to their fleets and operating them efficiently. Anglo-American and DAPG were the two leading shipowners in the Standard Oil Interests. By 1899 the English company owned ten steamships, including the *Tuscarora,* capable of carrying two million gallons and proudly proclaimed the largest tanker in the world. These steamers cut down loading time and averaged about nine transatlantic round trips a year. Their accounts showed a tidy profit on almost every voyage. After 1895, when growth of business necessitated outside charters and freights were high, experiments were made in towing steel barges to increase the transatlantic load.[20] Anglo-American also acquired six sailing ships to carry some of the cased oil from Eastern American ports to the Far East. DAPG had seventeen steam tankers by the end of the century; its original five, increased to fifteen by 1892, had suffered a reduction of three through sale and loss at sea, but five new ones had been added, four of which were among the earliest built in German shipyards. In 1894 DAPG had the tanker *Helgoland* prepared to be the first to carry the more inflammable naphtha in bulk, as industrial demands for the product in Germany grew.[21] The American Petroleum Company accounted for most of the remaining dozen ships in the ocean-going fleet of affiliates, although Aktien Gesellschaft Atlantic provided two tankers for the bulk trade to Italy.

All vessels in which the Standard Oil group was interested, with the exception of a few coasters, were operated under foreign flags, but their economic importance to the Americans was significant. As suppliers of

products to and stockholders in foreign marketing affiliates they benefited from regularity in transportation facilities and enjoyed part of the pleasing profits from the carrying trade.

Speed in acquiring facilities for bulk transportation and distribution on land, and the methods of carrying out the operations, varied from one affiliate to another. Predilections of the managers, as well as the differences in the markets served, gave variety to the patterns. All the affiliates erected or purchased large storage tanks at ports of entry, increased the number of their tank cars and tank barges, and built or acquired some tankage at interior distributing points. Italo-Americana, operating in a country with a small volume of kerosene sales, required much less storage capacity and fewer tank cars than Anglo-American. Because of the cheapness of water transportation and the excellent rivers and canals in the Low Countries and Germany, American Petroleum and DAPG acquired larger fleets of tank barges than the others. These carried an increasing quantity of petroleum products up the Scheldt, Rhine, Maas, Elbe, and Oder rivers and other waterways to strategically placed storage facilities.[22]

The decisions to adopt some methods depended on a variety of factors. The establishment of stations and substations was related to the extent to which the importer-wholesaler assumed the jobbing function and sold to retailers. Anglo-American, which distributed directly to many retailers, rapidly increased the number of its small stations, while Det Danske, which sold almost exclusively to wholesalers and jobbers, had but few. Before replacing distribution in barrels with tank-wagon deliveries in a city or town, managers of affiliates had to consider the nature of the competition, their own relations with wholesalers and jobbers, the concentration of population, the per capita consumption of kerosene, conditions of streets and highways, topography of the land, laws and ordinances, the customs of the people, and their own degree of flexibility.

In fact, techniques of distribution from bulk stations differed considerably from one company to another and from one part of a company's marketing area to another. The first tank wagons had rumbled over the streets in the United Kingdom before the organization of Anglo-American, but it was the first firm to utilize the method in Europe on a large scale. While increasing its sales of kerosene from 1,650,900 barrels in 1892 to 3,082,400 barrels in 1896, it raised the proportion which it delivered by tank wagon from 28 to 45 per cent. DAPG's managers introduced tank wagons in Bremen, Hamburg, Danzig, Bromberg, and the Rhenish Provinces, but even at the end of the century the barrel reigned supreme

in a large part of Germany for deliveries to retailers and even to many jobbers. American Petroleum featured delivery in iron barrels or tank wagons, but in Amsterdam, where tank wagons were not permitted on the streets, lighters were used to the fullest extent possible. All deliveries in Norway and Sweden were in barrels from the ports of entry, while in Copenhagen retailers received kerosene in liter bottles stowed in compartmentalized boxes; jobbers rather than Det Danske did most of the bottling. For delivery in mountainous or hot or sparsely settled areas in Switzerland, Italy, and Sicily, Italo-Americana used cans, manufactured in its own plants at Venice and Savona after 1895. These factories in their first three years of operation (1896-1898) made and filled nine million cans.[23] Variety was indeed the spice of life in delivery of kerosene to jobbers and retailers.

The importers also inherited or developed different patterns in dealing with customers. Taking Europe as a whole, most sales of the affiliates at the beginning of the nineties were to wholesalers and jobbers, but in some areas the affiliates rapidly increased their deliveries to retailers and in a few areas to householders.

Det Danske sold in Sweden to six wholesale companies, in all of which it was a minority stockholder and with all of which it concluded supply contracts. In general the buyer was committed to obtain all its requirements of petroleum from Det Danske, and to restrict itself to a defined sales territory. If the buyer received an offer of lower price from a third party, Det Danske had first refusal to meet the price; in any case the quantity was to be counted against the annual minimum which the buyer guaranteed to take. In return Det Danske agreed not to sell to others in the sales district covered by the contract and not itself to build storage facilities in the area. Quotations were made both f.o.b. Copenhagen, or, where a whole cargo was sold, c.i.f. Swedish coast. By 1899 these contracts covered most of the present Sweden and the southeast coast of what is now Norway.[24]

In Holland and Belgium the American Petroleum Company moved "closer to the trade," to use the marketers' term for nearness to the ultimate consumer. In some areas it accomplished this by binding jobbers closely to itself. Beginning in the early autumn of 1892, American Petroleum concluded five- or ten-year agreements with dealers; the jobbers committed themselves to buy exclusively from American Petroleum in return for the latter's promise not to sell directly to the buyers' customers. These contracts stipulated that the jobber should push bulk deliveries in

tank cars and iron barrels. To gain the orders of a large jobber in Luxemburg, American Petroleum financed the installation of equipment for bulk distribution in return for a share in profits. In several cases the jobber, although continuing his firm's name, was affiliated through stock ownership with American Petroleum and worked on a salary and commission under suggestions from the parent company, including the stipulation that he should charge customers less per gallon for bulk deliveries. As one of the astute Dutch managers of the importing company remarked, the close relations with jobbers had one important advantage over direct participation in sales to retailers: it saved the firm from acquiring as enemies those it retained as customers.[25]

In many cities in Holland and a few in Belgium, however, the managers of American Petroleum sold directly to storekeepers, and through some affiliates even delivered to householders. From "retail stations" they marketed a minimum of one iron barrel to stores in Holland. Eager to keep the friendship of many small petroleum dealers in Belgium, the company moved slowly into the jobbing business, at first only in Antwerp, Brussels, and Bruges. To retail customers in those cities American Petroleum loaned "shopkeepers' barrels" or tanks, to hold 225 liters of kerosene. The tanks, manufactured in the supplier's own machine shops starting in 1892, were reported as "handsomely painted" in red and green, with large gold lettering: "Best American Petroleum of the American Petroleum Company." In Holland tanks were supplied free of charge, against a receipt, to retailers who bought either directly from American Petroleum or from jobbers under exclusive contracts. Through Automaat, an affiliate in Rotterdam, kerosene was carried directly to the householders in hand- or dogcarts and delivered in four-liter cans. With coal and wood relatively expensive in the Low Countries, American Petroleum endeavored to stimulate the use of kerosene for heating by keeping its price low. Next to the United States, Holland and Belgium had the highest per capita consumption of kerosene.[26]

Although a great deal of the bulk distributing equipment of Standard Oil affiliates was ordered new, they all acquired property and a large volume of business by buying out or into other firms. Within four years of its organization in 1890 DAPG bought and merged several importing and shipping houses, including G. H. J. Siemers & Company in Hamburg and August Sanders & Company and Amerikanische-Petroleum-Import-und-Lagerhof Gesellschaft in Stettin. Such purchases added bulk distributing facilities and locally experienced staffs to DAPG. Anglo-Ameri-

can likewise acquired the Mellons' shares in The Bear Creek Oil & Shipping Company, Limited,[27] and the stock of The Kerosene Company, Limited, both importers and marketers in England. By leasing all the tankage of the Rothschilds' Société Belgo-Hollandaise des Pétroles in 1893, American Petroleum acquired needed increased storage capacity in Antwerp and, in friendly fashion, reduced competition. Three years later American Petroleum and DAPG probably made one of their most important additions when they acquired a large interest in H. Rieth & Company, Nobel's marketer. In the Low Countries the firm was reorganized under a similar name. DAPG and Italo-Americana each held shares in two Swiss companies—Petroleum Import Compagnie and Schweizerische Petroleum-Handels-Gesellschaft. These houses, as well as several others listed in Table 24, continued as separate affiliates rather than being merged. Most of the firms in the table were customers of the holding companies rather than former competitors.

In consequence of purchase of shares in corporations or by agreements, several of the Standard Oil affiliates undertook to market quotas of Russian kerosene. When Anglo-American acquired an interest in the Rothschild firm in the United Kingdom, it assumed long-term contracts to market an unascertained amount of Russian kerosene. When Rieth & Company was purchased, its contract with the Nobels was continued and in April, 1897, American Petroleum guaranteed to market annually for five years 2,000,000 poods (about 250,000 barrels) of Nobels' kerosene. Renewal of the lease on the tankage facilities of Belgo-Hollandaise for 1899 was granted by the Rothschilds only upon the stipulation of a quota of 1,000,000 poods of their oil, although at the same time the purchase from the Nobels was adjusted. Società Italo-Americana also shouldered a quota for Russian oil when it purchased shares of Società per gli Olii Minerali of Genoa. Probably these arrangements gave rise to the repeated newspaper reports that Standard Oil had signed a general agreement with the Russians, headlined by colorful references to the Octopus and the Bear.[28]

No complete statement exists as to the reasons for the arrangements to sell some Russian oil, but a variety of circumstances undoubtedly contributed motivation. The European affiliates of Standard Oil had the right to obtain their supplies wherever they wished, and some of their customers requested the Russian product. Some of the understandings between Standard Oil affiliates and competitors dated from 1893; the depression encouraged joint efforts. In purchasing wholesale or jobbing

Table 24 EUROPEAN AFFILIATES OF ANGLO-AMERICAN OIL COMPANY, LIMITED, 1899

- Continental Companies with Their Affiliates
  - Aktien Gesellschaft Atlantic, Germany
  - American Petroleum Company, Holland and Belgium
    - Amerikanische Petroleum Anlagen GmbH
    - Compagnie Pétrolifère, S. A., à Gand
    - H. Hutsteed org.
    - Hollandsche Petroleum Vereniging, Amsterdam
    - Maatschappij tot Detailverkoop van Petroleum "De Automaat"
    - Mannheim-Bremer Petroleum-Aktiengesellschaft[a]
    - Petroleum Raffinerie vorm. August Korff[a]
    - Pétrolifère Nationale, S. A., à Gand
    - Société Anonyme pour la Vente des Pétroles, ci-devant H. Rieth & Cie
  - Det Danske Petroleums-Aktieselskab, Denmark, with affiliates in Sweden
    - Aktieselskabet Ostlandske Petroleumscompagni, Christiania
    - Krooks Petroleum & Oljeaktiebolag, Stockholm
    - Skanska Petroleums Aktiebolaget, Helsingborg
    - Svenska Petroleum Aktiebolaget
    - Sydsvenska Petroleums Aktiebolaget, Malmö
    - Vestkustens Petroleum Aktiebolag, Gothenburg
  - Deutsch-Amerikanische Petroleum-Gesellschaft, Germany
    - Königsberger Handels-Compagnie
    - Mannheim-Bremer Petroleum-Aktiengesellschaft[a]
    - Petroleum Raffinerie vorm. August Korff[a]
    - Petroleum Import Compagnie, Switzerland[b]
    - Schweizerische Petroleum-Handels-Gesellschaft[b]
  - Società Italo-Americana pel Petrolio, Italy
    - Petroleum Import Compagnie, Switzerland[b]
    - Schweizerische Petroleum-Handels-Gesellschaft[b]
    - Società per gli Olii Minerali
- United Kingdom
  - Bear Creek Oil & Shipping Co., Ltd., The
  - Bristol & West of England & South Wales Petroleum & Storage Association, Ltd., The
  - Kerosene Co., Ltd., The
    - Tank Storage & Carriage Co., The
  - Sixteen shipping companies[c]

[a] DAPG and American Petroleum Co. both held shares in these companies.

[b] DAPG and Società Italo-Americana both held shares in the companies operating in Switzerland.

[c] There was a separate affiliate for each of the ten steamships (*Chesapeake, Delaware, Genesee, Lackawanna, Manhattan, Osceola, Potomac, Suwance, Tuscarora,* and *Weehawken*) and six sailing ships (*Drumelton, Ettrick, Juteopolis, Kentmere, Lawhill,* and *Lyndhurst*). All the shares in these companies, except for qualifying shares, were held by Anglo-American.

Source: SONJ, accts. of Anglo-American Oil Co., Ltd., 1899, and miscellaneous papers.

outlets, several affiliates of Standard Oil assumed current contracts to purchase the Caucasian product. Attempts to get rid of a price war, such as that of 1896, and to control the nature of competition undoubtedly also had their influence. European sellers of Russian oil, accustomed to working in co-operation with other businessmen, early sought agreements to share markets with their competitors; an understanding to have a quota of Russian oil taken each year in return for the leasing or sale of marketing property reduced profit-consuming competition. Nevertheless, the shortness of the agreements kept the threat of renewed rivalry always present, while in many areas marketers not party to the understanding already provided competition.

In fact, managers of Standard Oil affiliates in Europe continued to face uncertainties of all kinds during the late 1890's. Conditions in Anglo-American's market, which from 1893 was the largest foreign consumer of American kerosene, provide illustrations. Immediately after Anglo-American had moved into the Scotch market in 1894, a Select Parliamentary Committee was appointed in the United Kingdom to consider the question of raising the legal flash point for kerosene. Scotch and Russian kerosene each had a flash test above the legal minimum, while the bulk of imports of American illuminating oil would not meet the high figure proposed. Favorable to Russian kerosene, the London *Star* carried sensational stories which put the many fires and loss of life in Great Britain at the feet of the "American oil gang." Hearst's *New York Journal* echoed accusations that Standard Oil was dumping the "death-dealing" Lima kerosene abroad soon after the acceptance of this kerosene as a good delivery by the New York Produce Exchange in September, 1895, had enlivened competition in Europe. The many petroleum experts called before the Parliamentary Committee disagreed, with the result that no change was made in the flash-test requirement, but the investigations provided doubts for four years.

Meanwhile, in 1897, apparently believing that the most effective competition lay in meeting Anglo-American in the arena of marketing itself, Frederick Lane of Lane & Macandrew, mercantile and shipping firm, joined the Rothschilds in organizing the Anglo-Caucasian Petroleum Company. The new corporation inaugurated an extensive program of delivering high-test Water White Russian kerosene by tank wagon in Great Britain. A price war between this organization and Nobel's representatives followed, which in turn drove down the price of American kerosene. From 1897 to 1899 imports of the latter to Great Britain declined 3.4 per cent,

while those of Russian illuminating oil from Batum were rising 58 per cent.[29] Uneasy lay the head that wore the crown in British marketing of petroleum products.

On the Continent during the late 1890's the American Pure Oil Company provided the greatest new challenge to marketers of Standard Oil products. Within a few months of the organization of the Pennsylvania group, Lewis Emery, Jr., visited Berlin, accompanied by Philip Poth. The latter, a vigorous marketer of Mannheim and previously a customer of the American Petroleum group, had been won over to purchasing supplies from marketers of competing oils. Soon after the appeal of Emery and Poth to the German government, official criticism arose at the sale in Germany of "inferior" Ohio oil. To counteract the agitation, 26 Broadway dispatched to Berlin the well-known European-trained scientist, Professor Charles Chandler, who was assisted by Indiana Standard's young chemist, Dr. W. M. Burton. They successfully demonstrated that properly refined kerosene from Lima crude was a safe and satisfactory illuminant. When Emery returned to Europe in 1896 he found that American Petroleum and DAPG had drawn Philip Poth into their ranks by organizing and holding stock in Mannheim-Bremer Petroleum-Aktiengesellschaft. Pure Oil then began to acquire its own fleet of steamers, storage facilities in Rotterdam and elsewhere, tank cars, and an organization for efficient bulk marketing of Pennsylvania kerosene in the Low Countries and Germany.

In one area Pure Oil competed with Mannheim-Bremer. After marked success in concluding tying contracts with jobbers northwest of Mannheim in 1896 and 1897, Mannheim-Bremer found so much opposition in southwestern Germany that it suspended making such contracts, even before complaints reached the Reichstag. Whether or not the aged Poth died of a broken heart as a result of becoming affiliated with Standard Oil, as his new competitors sentimentally reported, his company continued to have lively rivalry on the banks of the Rhine.[30]

In 1899 managers of Standard Oil's affiliates in Europe could look back on the work of the preceding seven years with a measure of pride. The total European imports of American kerosene had risen from 9,199,000 barrels in 1892 to 12,784,300 in 1899, almost 40 per cent, in spite of the growing consumption of competing foreign oils, artificial gas, and electricity. Through energetic management the affiliates of Standard Oil had maintained the European market for American petroleum products, though sellers of competing American oils were beginning to play a more

significant role than earlier in carrying American oil and methods to Europe.

The companies purchasing from Standard Oil had made progress in adopting methods of bulk distribution, even if in some areas the progress was slow. An American consul in Europe referred with pride to "the push and enterprise of the Standard Oil Company's management."[31] With the reduction in the number of middlemen, speculation in petroleum by importers and wholesalers had been lessened. The costs of transportation and distribution per unit had been reduced, and, although profits were generally excellent, on the basis of evidence available it is clear that some of the economies of increased efficiency had been passed on to the consumers. A case in point was American Petroleum's wise recognition of the advantages to itself of encouraging larger and additional uses of kerosene by reduced prices. Obviously, without a study of the policies of those middlemen who still stood between the ultimate buyer and the Standard Oil affiliates, together with a study of retail prices in the various markets, the gains to the consumers cannot be measured. Agreements had been made by the affiliates with some competitors, but, as attacks in the legislatures and markets both showed, no marketers could rest comfortably on past laurels. By 1899, when Jersey Standard assumed parenthood of the foreign affiliates, a more dynamic policy was needed to hold the European market.

CANADIAN AND LATIN AMERICAN OPERATIONS

In the 1890's Standard Oil men achieved important extensions of their activities in Canada, while in contrast they took only a few faltering steps in Latin America. Although Standard Oil affiliates continued the policy of refining in the Caribbean area, inaugurated in the 1880's, and an attempt was made to establish a refinery in Rio de Janeiro, most of the small volume of petroleum products exported to South America from the United States was handled by middlemen, as earlier. At the beginning of the decade Standard Oil's products were marketed in Canada by two small corporations in which the combination had purchased shares, by a few bulk stations of marketing companies which extended northward across the border, and by outside jobbers. By the end of the century The Imperial Oil Company, Limited, was affiliated with Anglo-American Oil Company, Limited, which brought into the Standard Oil group its first fully integrated affiliate outside the borders of the United States.

Though in 1892 Anglo-American assumed legal ownership of shares in

the Trust's small Canadian marketing companies, little or no change in management ensued. Undoubtedly all legal requirements were met, but administration followed practical lines rather than those of mere ownership. Marketing of Standard Oil products in Canada, whether by the two small affiliates of Anglo-American, or at the few northern stations owned by companies south of the border, was supervised by the Domestic Trade Committee. The Domestic Trade Department of the Standard Oil Company of New York was concerned with sales of The Bushnell Company, Limited, in Quebec and Ontario, and those of the Eastern Oil Company in the Maritime Provinces. Even after Anglo-American's new affiliate, the British Columbia Oil Company, Limited, was organized in January, 1898, and took over the marketing in Vancouver from Iowa Standard, familiar names like F. Q. Barstow and C. M. Coburn were among the stockholders. The new company's closest economic tie continued to be with Iowa Standard's head office at San Francisco.[32]

Growth in the marketing activities of those selling Standard Oil products in Canada can be illustrated by the expansion of The Bushnell Company, Limited, and the affiliated Queen City Oil Company, Limited. By 1894 Bushnell had extended its marketing from Montreal to Ottawa, Toronto, and Quebec. In Montreal it enlarged its facilities by acquiring another firm in 1896 and by erecting a bulk plant. At the same time it became the holder of sixteen hundred shares, acquired through F. Q. Barstow's negotiations, in a new company, The Queen City Oil Company, Limited, which, capitalized at $200,000, merged the Ontario interests of Samuel Rogers. This pioneer in selling Standard Oil products in Canada had long been associated with the combination, selling at times on commission and at others operating his own business.[33] On the basis of his properties and trade in Toronto, Hamilton, Ottawa, and smaller cities, Rogers was characterized as probably the largest jobbing distributor of petroleum products in the Dominion. As owner, with his son, of four hundred shares in the new Queen City Oil Company, Limited, he continued to be important in local management in Ontario. Using funds acquired from Standard Oil, Queen City Oil expanded its business, added stations, erected warehouses, built wharves, installed tanks, and enjoyed the advantages of a rail siding on the strategic lake front in Toronto.

While alterations in laws and regulations gradually facilitated the marketers' adoption of bulk methods of distribution, the changes were gradual; a full use of the newer methods awaited a later period. The removal of the ban on the importation of oil in tank cars came in 1893,

but for four more years shipments by water continued to be in barrels and cans, supplemented by the newly authorized 120-gallon drum. When in 1897 bulk shipment by tank vessels was permitted under certain conditions, there was a marked change in deliveries on the Coast and by the Great Lakes. At the same time, reduction of the tariff from six cents per gallon to five eased another burden on imports. Where municipal authorities offered no serious obstacles, marketers erected and effectually used storage tanks. For a time, however, oil still had to be packaged for inspection, and attempts to remove the regulations forbidding the use of tank-wagon distribution did not succeed until 1899.

In addition to expanding and improving its marketing activities, The Bushnell Company, Limited, added other functions. In 1896 it took over Rogers' small refinery (Fairbank, Rogers & Company) in Petrolia, the next year acquired a disused refinery, the Alpha, at Sarnia, and later bought other small plants.[34] The property at Sarnia had the advantages of being on the navigable St. Clair River and of having abundant water supply and space for expansion. The Atlas Works in Buffalo furnished both capital and personnel for reconstruction of the refinery at Sarnia and its expansion after the start of operations in October, 1897. Being part of the Standard Oil family, The Bushnell Company, Limited, could take advantage of the Frasch patents so important for refining oil of high sulphur content like the Canadian. The addition of a pipeline between London and Sarnia and the production of a small volume of crude oil completed the integration of the corporation.

In 1898 Standard Oil managers made their most important acquisition in Canada, The Imperial Oil Company, Limited. That organization already boasted a successful history from the date of its formation in 1880 as a consolidation of several small firms. Standard Oil's eagerness to buy probably stemmed from the fact that competition of this large Canadian company with firms selling products of Standard Oil was vigorous on both the economic and the political fronts. The opposition was lively in Ontario and extended to Quebec, the Maritimes, the Prairie Provinces, and British Columbia; in the West, Standard Oil's rival had been the more successful. Imperial offered several definite attractions: it possessed a liberal and extensive charter, the largest Canadian refinery, a national marketing organization, and a staff of able and experienced men who knew local conditions, including Frederick Ardel Fitzgerald and Jacob Lewis Englehard. By acquiring stock in the Canadian company Standard Oil men could carry out their usual policy of buying out rather than

fighting out able competitors. Instead of antagonizing proud Canadians by hard competition with a Canadian firm, Standard Oil could bring Imperial into its own family by affiliating it with a British organization, the Anglo-American Oil Company, Limited.

For its part Imperial Oil had various reasons for willingness to become associated with Standard Oil. Competition had been increasing. While still high, the tariff on petroleum had been reduced and offered less protection than earlier; even in 1895 one-third of inspected oil in Canada was imported from the United States. The development of bulk distribution called for expensive installations of stations and other equipment; heavy overhead and the need for a large volume of sales would make competition more rigorous. Imperial had already borrowed fairly extensively, and, in a country where credit was relatively tight, it might experience difficulty in obtaining sufficient funds for the sharper competition ahead. The depth of Standard Oil's purse was well known. The fact that managers of Imperial had been negotiating in 1895 with interests in England indicated that they were ready to call in outsiders. The depression of the 1890's had badly hit the young Dominion just developing its grain exports; businessmen generally were not overoptimistic. Finally, the refining situation had changed; through The Bushnell Company, Limited, Standard Oil had entered that phase of the Canadian petroleum industry. It seemed a good time to form an alliance.

Negotiations, which were brief enough to indicate smooth sailing, were soon completed. On July 1, 1898, managers of the Canadian corporation agreed to the sale of 75 per cent of its stock to the Standard Oil group; the final contract was signed three months later. Imperial Oil increased its capital from $500,000 to $1,000,000 in order to absorb other firms. Under the terms of the agreement most of the companies and plants in Canada affiliated with Standard Oil—Eastern Oil Company, The Bushnell Company, Limited, the British Columbia Oil Company, Limited, and the plant of the Standard Oil Company (Indiana) in Winnipeg—were brought into Imperial, as were the plants of several small competing refiners. Through Anglo-American Oil Company, Limited, Standard Oil held the majority of the shares in a corporation which had a nation-wide Canadian marketing organization, a small interest in production, and a sizable refining capacity. While the *Cleveland Leader* generalized about Standard Oil's "absolute monopoly" of refining in Canada, Archbold more modestly assessed its share at 75 per cent.[35]

In the meantime Standard Oil had made but minor changes in earlier

policies in Mexico and the West Indies. Waters-Pierce, an affiliate of Jersey Standard, continued to send crude petroleum from Philadelphia and to refine and market it successfully in Mexico. In 1897 Waters-Pierce built a new refinery, including a canning plant, in Tampico to use crude oil from the East Coast and Corsicana, Texas, and also began to anticipate the possibility of a supply of raw material in Mexico. Standard Oil managers investigated in 1898, as they had done ten years earlier, the petroleum resources of Cuba, but, on the advice of production men, Archbold & Conill's refineries in Cuba and Puerto Rico continued to import raw material from the United States. Standard Oil weathered the accusation of Pulitzer's *World* that it was a peacemonger and enjoyed praise from other newspapers for selling some and leasing other parts of its small coastal fleet to the United States government during the Spanish-American War.[36] At its conclusion Archbold and his associates faced the necessity of considering the adjustments necessary in their policy to meet the altered status of the Spanish West Indies.

Developments in Standard Oil's policy in South America were few and not very successful. All shipments of kerosene to that area continued to be in cases and cans. In most countries tariffs were high and the markets for petroleum products comparatively undeveloped. In Peru the growth of domestic production reduced the imports of kerosene from the United States. In August, 1896, managers of Standard Oil organized a company in West Virginia to undertake new operations in Brazil, which was by far the largest importer of kerosene on the South American Continent. Jersey Standard held 70 per cent of the $500,000 capital of the new Empreza Industrial de Petroleo, which hopefully started on the construction of a refinery at Rio de Janeiro. American experts, including seventy-year-old Asa Bush of Olean who had recently directed masonry construction at Rouen, went to Brazil, and for one year a small export of crude petroleum from the United States followed. Changes in tariff caused the abandonment of the project.

According to reports, Standard Oil also modified its policy of sales to South America. Earlier it had sold kerosene to exporters through brokers; now Standard Oil began to sell directly to selected agents in the larger South American ports. To the extent that this new policy was followed, it eliminated some middlemen, but it occasioned no great increase of exports of kerosene from the United States to South America; the volume reached a high of only 999,000 barrels in 1898.[37] The Oriental market was much more attractive.

ORIENTAL POLICY

Executives of Standard Oil had ample cause for giving special attention to the Far East in the 1890's. A huge population offered a large and comparatively undeveloped market for kerosene, with little immediate possibility of much competition from electricity or gas. Standard Oil men had become accustomed to sizable sales for export to that area, but they met increasingly vigorous competition as the nineties progressed. New sources of supplies, as well as innovations and combinations among Standard Oil's foreign rivals, called for new policies by the American executives if they were to hold, let alone expand, their market.[38]

For several reasons Russian kerosene became, in one Oriental market after another, a more important competitor than it had been previously. Not only were its lower cost of production and lower price directly in its favor, but the tariffs levied on value fell less heavily on it than on American oil. Petroleum traveled from Batum to India in thirty days, compared with the passage of four and a half months from the Eastern coast of the United States. Uncertain conditions of foreign exchange in the early nineties also discouraged merchants in the East from making long-term commitments.[39] The chief condition favoring the Russian product, however, was the enterprise of Marcus Samuel.

In the summer of 1892, Marcus Samuel & Company, which had previously carried kerosene in cans in mixed cargoes to Oriental ports, inaugurated bulk shipments to the Far East. Marcus Samuel had obtained a commitment of supplies of Russian kerosene for ten years from the Rothschilds, persuaded the governors of the Suez Canal to permit passage of illuminating oil in bulk under strict regulations, and had ordered a specially designed tanker, the *Murex*. The firm located bulk stations strategically in the Far East and operated them in conjunction with canning plants. Enjoying the low cost of Russian oil f.o.b. Batum, the economies of bulk ocean transportation, and facilities for convenient packaging near markets, Samuel offered serious competition to all rivals. Within his first year of bulk shipments the imports of Russian kerosene to India increased a third and exceeded American imports, which had declined.[40]

Before the century ended Marcus Samuel had strengthened his position in the Far East by combining with other marketers, by becoming established as a producer, and by commencing shipments northward to Europe. In February, 1898, The Shell Transport & Trading Company, Limited, capitalized at £1,800,000, brought together a large number of

experienced merchants of petroleum in the Orient, including Samuel & Company. An allied Dutch firm, Nederlandsch-Indische Industrie en Handelmaatschappij, had already made an inauspicious beginning in production in southeastern Borneo, where jungle fever or whisky claimed a succession of its American and Canadian drillers. The first oil struck was extremely heavy and so low in kerosene content that a Standard Oil expert observer commented: "*A great big bluff or an awful mistake is being perpetrated.*"[41] In the same month as the organization of Shell, however, Alderman Marcus Samuel of London dramatized the launching of the oil-burning *Haliotis*. His speech predicted that the marine use of fuel oil would constitute the greatest revolution in the method of propulsion in his generation. Within a few months Samuel's first shipment of Borneo oil was sent northward through the Suez for trial by the British Navy. New strikes of lighter oil and the construction of a modern refinery enhanced the contributions of Borneo, while Shell also undertook to market the output of some small producers in the Indies.

In the last year of the century a letter from an indignant agent marketing Standard Oil's products in Batavia bore witness to the strength and vigor of Shell's marketers. "They advertise everywhere, loudly, broadly, and boldly about how they are going to run the Standard Oil Co. out of Netherlands India, and have been doing that steadily for the last four years until my ears are tired and sick of such trashy rubbish," he grumbled.[42]

In the meantime, several other sources of petroleum in the Far East had been opened up and were providing strong competition to American oil. In both Burma and Japan refiners improved their methods and to an increasing extent used native crude to produce kerosene for local markets. More important was the development of several companies in the Dutch East Indies. Adriaan and J. A. Stoop's Dordtsche Maatschappij tot Opsporen en Exploiteeren van Petroleumbronnen op Java (Dordtsche Petroleum Company), with production from Surabaya and a refinery at Wonokromo, turned out a low-grade, smelly, inexpensive kerosene which satisfied the large demand of the many small chimneyless lamps of Java and narrowed the market for imported oil. The growth of De Koninklijke Nederlandsche Maatschappij tot Exploitatie van Petroleumbronnen in Nederlandsch-Indië (Royal Dutch Company), the most successful of numerous firms in Sumatra, was significant over a wider area than Dordtsche. In the same year that Samuel's tankers began traveling to the East, Royal Dutch sent its first shipments to Penang and Singapore. Four

years later the exports of the Dutch East Indies to Asia and Oceania (China, Japan, East Indies, and Australia) totaled more than three million barrels and almost equaled the exports to that area from the United States.

A Standard Oil producer confirmed the opinion of men at 26 Broadway in 1897. "Now that oil has been discovered in the Far East in profitable quantities," he wrote, "you must *forever* count on its being an important factor in this [Oriental] trade and the only question to consider is how best to meet it."[43]

Several policies were open to the managers of Standard Oil. The Americans could pursue more energetic marketing methods to sell their high-grade kerosene or they could manufacture a lower-grade, cheaper product for sale in the Orient. They might also purchase and distribute the less expensive Russian illuminating oil. Another possibility was to obtain their own sources of crude petroleum in the Pacific and refine it near the market. Standard Oil men eventually pursued all these approaches, but they met with varying degrees of success in achieving their aims.

The Americans first attempted to meet the competition by changing their marketing techniques. In 1890, instead of depending on sales to merchants who exported to the Far East, Standard Oil had started making some consignments to that area through the Anglo-American Oil Company, Limited. Three years later the Standard Oil Company of New York established its own "Asiatic Stations." By early in 1894 its managers or agents were active in Shanghai, Calcutta, Bombay, Hong Kong, Yokohama, Kobe, Nagasaki, Singapore, Batavia, and Surabaya. All shipments from Standard Oil refineries to the Far East went on consignment from New York Standard to its resident agents, who sold to local wholesalers and jobbers. The shipments were in cases and cans loaded at Philadelphia, New York, and Weehawken into sailing ships, some few of which were owned by Anglo-American.[44]

Several considerations led Standard Oil men to continue the traditional practice of shipment in cases and cans to the Orient. The voyage was long, and losses by fire on sailing ships were few and costs were low. Cans leaked less than barrels and were convenient for stowage in cases in ships as well as for transportation into the interior of Far Eastern countries. As Standard Oil's competitors discovered, consumers in the area also wanted the tin cans for buckets and roofing and to make many metal articles for use in the household and on the farm. Even the wood from the cases was fashioned into other objects, especially in China.

Having decided generally to stick to their policy of exporting a quality kerosene, Standard Oil officials would be taking a chance of large losses if they invested substantial sums in new tankers, bulk stations, and canning factories in Asiatic ports. What return cargoes would there be for oil tankers for the long journey? Furthermore, in the early nineties, with production and stocks of American oil declining and consumption at home increasing, a question Americans were asking was: "Where are we to get the oil to supply our trade?"[45]

The agents of Standard Oil used many methods, however, to enlarge sales and to protect and forward their positions in the Far East. They prepared special pamphlets in various languages for dissemination, sold cheaply small lamps and suitable wicks, and appealed to American consuls for aid when, for example, they found Chinese merchants selling, in Standard Oil cans, Russian kerosene imported in bulk. The marketers gradually expanded their operations; as soon as Chungking, China, lifted its prohibition (1894-1896) on the use of kerosene, Standard Oil sent a subagent to study the market in that city and to assess the extent of the local production of petroleum in the Szechwan Province.[46]

In spite of all efforts, the competitors continued to gain on Standard Oil, a fact which one experienced oilman attributed in part at least to the faulty marketing methods of the combination. Its greatest success had been achieved in Japan, where Standard Oil marketers were close to the ultimate user; in other areas the products passed through so many hands that a reduction in price to jobbers seldom reached the consumers. The observer, frankly not a specialist in marketing, recommended an annual meeting of all managers in the Far East, closer relationships between this distant group of employees and the home office, and an inspection trip by a marketing expert for a study of the situation. It was also clear, as the observant reporter mentioned, that, with some notable exceptions, even experienced marketers from the United States were at a disadvantage when competing with those intimately acquainted with the intricacies of Oriental trade.[47] He might have contrasted the disadvantages to Standard Oil of sending high-grade kerosene in cans from the eastern United States on the long journey in sailing ships with the advantages gained by shippers of Russian oil in bulk to canning plants in the Far East. The writer saw clearly the economic advantages which his company would enjoy if established as a producer and refiner in the Pacific.

During the 1890's, in fact, Standard Oil made several studies of producing properties bordering on the Pacific and attempted to become

established as a foreign producer. Its men gathered information about production, or prospects for production, in China and Sakhalin and dispatched experienced production men to study the resources of California, Alaska, and the Dutch East Indies. In 1892, the same year that sales of Russian oil to the Far East mounted and Royal Dutch began to export, Standard Oil men visited Sumatra and negotiated for a mining concession, but they lost interest after a native revolt.[48]

To gather pertinent information on the competitive situation, and to help forward negotiations to establish Standard Oil as a producer in the Dutch East Indies, Archbold sent two of his producing men to the Orient in January, 1897. C. F. Lufkin, manager of The Ohio Oil Company, was a veteran of many oil fields in the United States, was an astute judge of men and producing territory, and had studied the Dutch East Indies personally in 1892. Employing the usual technique of checking on the opinion of one man by getting an independent report from another, Standard Oil managers chose young John H. Fertig to accompany the older man. Fertig, the son of one of the earliest producers in the old Oil Regions who had recently sold his refinery in Titusville to Standard Oil, came fresh from his own pioneer work in managing the Forest Oil Company in Kansas; an easy personality, as well as his general background in the petroleum industry, recommended him for his new task. As Lufkin and Fertig saw it, the purpose of their assignment was clear: "It is not a debatable question as to what ought to be done, but rather a question whether anything can be done, and how to accomplish it."[49]

Lufkin and Fertig arrived in the Dutch East Indies in March, 1897, well briefed for carrying out their work. They had accompanied Libby to Europe, studied newspapers and the annual reports of various companies, met some of their officers in Holland with whom Libby was already carrying on tentative negotiations, and carried introductions to local managers in the Far East. Everywhere that the production experts went in the Indies they were courteously received by the Dutch. They also gathered information from the gossipy, homesick American drillers and a few refinery workers from Bradford, Pennsylvania.

The reports of Lufkin and Fertig to Archbold differed in details but were in substantial agreement on general conditions and evaluations of specific companies in the Dutch East Indies. Lufkin, feeling old and tired after several arduous weeks of travel in an enervating climate and many conferences with Dutchmen full of a "colossal faith" in the country, was most opposed to wildcatting by Standard Oil. In his opinion "old time

local talent" with knowledge of the language, and the favor of the local chiefs or sultans, were essential for operations in such rugged country. Neither did Fertig recommend "a promiscuous search through such an enormous expanse" of steaming jungle. He agreed that it would be cheaper in the Dutch East Indies, as in the United States, to purchase developed or partly tested producing territories.[50]

Both men recommended that Standard Oil should "assimilate the successful" companies, starting with the Royal Dutch. "Without some such Combination I must believe that your company would always be at a great disadvantage over here," Fertig wrote to Archbold, "for the ways of the Dutch Colonial Government are past finding out, and besides the Dutch subjects always *expect* to go away from home to work and they would gladly enlist for such a company, while you will always find it difficult to keep enough Americans here, of good business ability to make the management."[51]

The Royal Dutch was the first choice for a variety of reasons. "In the whole history of the oil business," agreed Lufkin and Fertig, "there has never been anything more phenomenal than the success and rapid growth of the R. D. Co." Its production, which had reached ten thousand barrels a day by the summer of 1897, was rising rapidly. Pipelines carried crude to refining facilities on a navigable river. Fertig was impressed by the efficient leadership of J. B. A. Kessler and the local management, and by the adequate construction of the refining units, of the houses for workers, and of the canning plant equipped with machinery imported from E. W. Bliss Company of Brooklyn. The crude yielded 50 per cent of kerosene and, although it had an odor, the oil burned well in special "Crown Oil Burner" lamps. Fertig remarked that some "American push" would improve the marketing, but by July, 1897, he could report that a start had been made in bulk distribution to tanks at Hong Kong and Shanghai. Although benzine or gasoline, which constituted 30 per cent of the refineries' product, was to some extent burned as waste, it was already finding an export market in addition to its use under stills and for street lighting in the Indies. In spite of expensive equipment and heavy taxes, costs seemed incredibly low to the Americans because of rich production, low wages, no use of acid in refining, no cash outlays for fuel, and inexpensive bulk water transportation. Given the company's progressive management, ample financial means, and influence with the Dutch government, Fertig concluded that neither Russian nor American competitors with their kero-

sene carried from a distance could meet the new force of Royal Dutch in the oil industry of the East.[52]

Reports from Lufkin and Fertig were the basis for analysis, discussion, and decisions at 26 Broadway and for additional deliberations and negotiations in Europe. Joined by Lufkin in London in the summer of 1897, Libby held daily conferences with James McDonald of Anglo-American, T. C. Bushnell of the Export Trade Committee, and W. H. Tilford of the Executive Committee to consider the Oriental policy of the combination. Libby, well informed on the currents in European oil circles, was doubtful of success in negotiating with Royal Dutch; its shares were quoted at 800 per cent of par, and he was aware that its management and Samuel's interests were drawing closer together.

Standard Oil men agreed on the need for prompt action. Libby advised some demonstration of Standard Oil's strength in the Pacific. He favored locating bulk stations, or purchasing Blakang Padang, the island near Singapore where one Ali Cohen dreamed of establishing a "Grand Central Refinery," or a move to acquire one of the small producers in the Dutch East Indies. In fact, Libby recommended "almost anything that would foreshadow and advertise some new and aggressive Eastern policy" on the part of Standard Oil. "Every day makes the situation more serious and dangerous to handle," F. Q. Barstow wrote in a memorandum. "If we don't get control of the situation soon, the Russians, Rothschilds or some other party may."[53]

Libby's doubts as to the possibility of coming to an agreement with Royal Dutch proved correct. He had first approached officials of the company in 1895, with no success. Nevertheless, during the summer of 1897 he submitted a proposal to the company for expanding its capital from three million guilders to twelve million, the Standard Oil combination to subscribe for all the additional shares. Kessler took the proposition to his directors but recommended rejection. They had no wish to surrender control to the Americans and refused the offer early in September.[54] Libby and his associates had to pursue other lines of attack which they had already initiated.

On the basis of the various recommendations, Standard Oil executives negotiated with several companies which had properties in the Dutch East Indies and by February, 1898, had reached a tentative agreement with one, the Moeara Enim Petroleum Company. While negotiations with Shell quickly broke down, those with Moeara Enim proceeded smoothly. Although the company's concession for exploration was on land deep in

a "dense swampy jungle," Fertig recommended allying with the company; its production was promising, and plans were under way to build a pipeline to a site below Palembang on the Moesi River for which Boverton Redwood, assisted by practical refiners from the United States and Russia, was designing a refinery on the continuous distillation principle. An important asset was a good manager, Jan Willem Ijzerman, who was willing to form an alliance with a company which would provide marketing facilities for his products. Because exploration and mining rights in the Dutch East Indies could be held only by Dutch citizens, inhabitants of the Netherlands or the Netherlands Indies, or by a company organized in one or the other, the tentative agreement called for a new Dutch corporation. The stock would be held by the two negotiating firms.[55]

The meeting of the stockholders of the Moeara Enim Petroleum Company, scheduled to discuss the proposal on February 24, 1898, was postponed and no agreement was reached with Standard Oil. Newspapers in Holland were loud in their comments about the rumored agreement and bitter in their attacks on the "great American Trust." "The principal opposition," Fertig declared, "comes from the Brokers and Speculators, who see in the entrance of the S. O. Co. an end to speculation, and a beginning of sound business." The directors of the Royal Dutch were not only willing to give advice to their government but at the psychological moment announced themselves eager to follow up their own earlier negotiations with Moeara Enim. The Dutch Minister of Colonies, Jacob Theodore Cremer, tactfully wrote to the board of directors of the latter company, expressing uncertainty as to whether the government would transfer the five-year concession for exploration, dated October, 1893, or would grant the concession to mine, which was customarily given for seventy-five years after discovery of oil. If the veiled threat was carried out, of course there would be no concession or petroleum products for the projected company. The agreement with Standard Oil was not signed; Moeara Enim received its mining permit and shortly thereafter contracted with Shell to market its products.[56]

In the meantime Royal Dutch itself had assured its independence of Standard Oil. Originally its stock certificates were made out to the bearer, but early in 1898 a special class of shareholders was created in which was vested the right to nominate all directors and to change the capitalization and statutes. The special stock could not be transferred without the authority of a general meeting of the special shareholders. Admission to their ranks was only by invitation and to those individuals (persons or com-

panies) who met the eligibility requirements for holding a concession to mine in the Dutch East Indies. Fertig predicted that Royal Dutch would never merge with Standard Oil; quite apart from what he characterized as a "sentimental barrier," the managers of the Dutch company, enjoying 15 per cent of the profits, would, in his opinion, never carry through any negotiations.[57]

Standard Oil also engaged in new tactics to improve its position in the Far East during the late 1890's. In the second half of 1897, price wars broke out in the Orient and, in order to improve its relative position in the market, Standard Oil, along with others, cut its prices, which were usually higher than those for Russian oil. Late in the following year the Americans added to their offering, which had been chiefly high-grade Devoe oil, a second grade at a lower price. Though some supplies of the latter came from Bayonne, apparently most originated in Russia.

Before leaving the Orient in 1899, Fertig, who had experienced a difficult time for many months, found satisfaction in watching the Royal Dutch officials become so harassed by circumstances that they had to follow Standard Oil's policy. When it seemed clear that Standard Oil was not going to be allowed to acquire any producing concessions, the local Dutch governmental and corporate officials, once so cordial, consistently frustrated Fertig in his quest for information. "Dutch obstacles are about the most difficult in the World for Americans to remove," he commented, "for Americans are always in a hurry and Dutchmen never."[58] When Standard Oil began marketing some Russian oil, Fertig in turn found himself plied with questions by the anxious Dutch who suspected a Russo-American alliance. By 1899 Royal Dutch officials, experiencing a falling off in their production when some wells began to flow salt water, were also temporarily buying and selling Russian kerosene, which was in plentiful supply, in order to hold the market which they had built up so quickly. There was nothing static about the competitive pattern in the Orient.

Standard Oil's efforts in the Far East proved relatively ineffectual. During the years under review total exports of American kerosene to Asia and Oceania (including Hawaii), which were made largely by Standard Oil, fluctuated between a low of 3,024,800 barrels in 1892 and a high of 4,648,000 in 1894, but in 1899 were only 2,966,000. The annual net earnings from Standard Oil's "Asiatic Consignments" also varied widely, but were never in the red.[59] Standard Oil was finding several advantages in being established in the Far East as a marketer through one of its own com-

panies, but reports indicated that the Americans still had much to learn. The decision to become a producer and refiner in the Pacific had been quickly reached, but attempts to achieve the goal had been forestalled. The Americans were endeavoring to meet their disadvantageous competitive position in the Far Eastern markets by buying and selling some Russian kerosene. Standard Oil would never again be anything more than one of several contenders for the leader's crown in the Far Eastern petroleum markets. It was obvious that the American combination must continue attempts to build a fully integrated business in the Orient and that it must in the meantime introduce bulk shipments and a cheap, second-grade oil if it wanted sales in volume.

Standard Oil's foreign tactics during the 1890's had produced mixed results. In France the organization had built a refinery and captured most of the French market for crude oil, though the political and economic conditions had kept the Americans from becoming an influence on marketing. In other European countries Standard Oil's affiliates had grown in size and had made varying degrees of progress in the application of bulk methods of distribution, in moving nearer to the ultimate consumer, and in reducing prices. In the Far East New York Standard had established its own wholesaling outlets, while in Canada The Imperial Oil Company, Limited, had been added to the Standard Oil family. The executives at 26 Broadway had decided to establish other foreign producing and refining affiliates in the Pacific, but for the time being they were checkmated in this effort, as in the expansion of sales in the Far East, by a new, powerful, and adroit Dutch competitor and The Shell Transport & Trading Company, Limited. Meanwhile Russian production had reached both absolutely and relatively a new high, and a slowly growing pipeline from Baku to the Black Sea promised soon to bring kerosene into the world market at still lower cost. Standard Oil's foreign policy had received increasing attention, but it was clear that both in the Far East and in Europe its products were meeting better-organized and stronger competition than ever before.

Chapter 10

The Domestic Scene, 1892–1899

WHILE holding their own, more or less, in foreign operations during the 1890's, on the domestic front Standard Oil executives turned their attention to consolidating gains flowing from their conquest of sour crude and to extending the application of policies previously inaugurated. They sought to stimulate production of crude oil both in established fields and in promising new ones, while striving to increase their own share of the total produced in the country. In the face of threatened decline in Pennsylvania-grade petroleum, the chief manufacturing problems were to expand and improve the refining of Lima-Indiana crude and the chief marketing task was to take advantage of and encourage the growing demand for products other than illuminating oil. While the depression which marked the decade did not seriously affect the petroleum industry, the competitors of Standard Oil organized their activities more effectively than previously.

Strong as Standard Oil Interests were in the 1890's, they experienced a decided increase in the intensity of competition. Not only did new companies arise in all phases of the oil business; several were also larger and better financed than most of the earlier ones had been. After developing gathering and local pipeline facilities by means of the Producers' Oil Company, Limited, and the Producers' & Refiners' Oil Company, Limited, oilmen of western Pennsylvania and New York built the United States Pipe Line to transport crude and refined oil as near the seaboard as opposition would permit. By 1895 the "independent" refiners and producers holding stock in these companies had further fortified their position by creating a unified marketing and financial agency in The Pure Oil Company, Limited, which became the holding company two years later. This organization provided lively and aggressive competition with Pennsylvania-grade products both at home and abroad.[1] At the same time, enterprising Middle Westerners literally flocked to the Lima-Indiana field with capital, particularly with funds from the lumbering and packing

industries. The Manhattan Oil Company, organized in 1890, grew into a spirited competitor of Standard Oil in several categories of the oil business. Such older firms as Scofield, Shurmer & Teagle eagerly sought a larger volume of sales by pushing from Ohio to the Great Plains the same bulk distribution techniques as the dominant combination. Standard Oil remained the largest integrated organization in the petroleum industry, but its managers did not enjoy in most localities that comfortable feeling of freedom from competition and ease of control so often attributed to them, and the growing strength of rivals foreshadowed the changes which were to come after 1899.

A PEAK IN STANDARD OIL PRODUCTION

During the 1890's the Standard Oil group encouraged the production of crude oil in various ways. The members worked to extend their own developed territory in the Applachian regions, to push operations in Ohio and Indiana, and to play an active role in opening new areas through an affiliate in Kansas and an associated partnership in Texas. New techniques of drilling, completing wells, and lifting oil were fostered. In part to encourage production by others in the Appalachian field, in January, 1895, Standard Oil changed its method of purchasing crude petroleum. Throughout this period its pipeline mileage grew slowly, but it sufficed to carry the fluctuating total of oil to old and new refineries.

Well launched as a producer by 1892, Standard Oil continued to increase its output of crude oil in both old and new fields in the nineties. The same reasons which induced top managers to go into production motivated them to favor expansion of this activity; especially important was the desire to maintain pipeline receipts in declining fields and to open up new areas in order to assure a supply of the basic raw material for the refineries.[2] The combination now also included a group of very independent executives eager to push their own function.

Three of Standard Oil's producing companies, together with an affiliate of one of them, accounted for the largest part of the output of the group. For most of the period The Ohio Oil Company, operating in the Lima-Indiana field, annually ranked first among Standard Oil producers. (See Table 25.) By 1898 it yielded first place to the South Penn Oil Company, which, from its start nine years earlier, had had its largest operations in the rich West Virginia fields. A distant third in production figures, the Forest Oil Company was active in several states and was noteworthy both for its work in new methods of production and for development of

Table 25 ANNUAL NET PRODUCTION[a] OF CRUDE OIL BY STANDARD OIL INTERESTS, 1889-1899

In thousands of barrels of 42 gallons

Year	The Carter Oil Co. West Va. & Ohio	Forest Oil Co.[b] Pa. & Kansas	South Penn Oil Co.,[c] Pa., N.Y. & West Va.	The Ohio Oil Co. Lima-Indiana	Total S. O.	Total Production of United States	S. O. Production as a Per Cent of Total of United States
1889			390	5,058	5,590[d]	35,164	15.9
1890		2,026	593	8,400	11,019	45,824	24.1
1891		3,762	1,152	9,319	14,233	54,293	26.2
1892		2,961	1,378	7,843	12,182	50,510	24.1
1893	1,001	2,405	3,299	7,261	13,966	48,431	28.8
1894	1,344	1,767	4,099	6,691	13,901	49,345	28.2
1895	1,562	2,921	4,594	6,852	15,929	52,892	30.1
1896	1,302	2,863	5,303	8,065	17,533	60,960	28.8
1897	1,250	2,326	6,269	7,520	17,365	60,476	28.7
1898	1,116	2,527	7,645	7,235	18,549[e]	55,364	33.5
1899	1,147	2,175	7,064	7,669	18,080[e]	57,071	31.7

[a] Net production is gross production less oil royalties of 1/16 or 1/8. Since Standard Oil produced the oil belonging to the lessors, if detailed figures were available for gross output they would give a more complete picture of Standard Oil's production efforts.

[b] The production of the Washington Oil Co. is included with that of Forest Oil Co. in 1892 and later. The Forest Oil Co. had production in Kansas starting in 1896. Its total for 1896, the biggest production year of the period in Kansas, was only 100,000.

[c] The figures for South Penn Oil Co. include its share of the production of The New Domain Oil & Gas Co. in Kentucky in which it held 50% in 1892.

[d] The total for 1889 includes 142,000 barrels produced by several small companies not listed separately. After that year the production of the West Virginia Oil Co., North Penn Oil Co., The Galena Farm Oil Co., Ltd., Producers' Consolidated Land & Petroleum Co., and other small companies is included in the figures for Forest Oil Co. and South Penn Oil Co.

[e] The totals for 1898 and 1899 include 26,000 and 25,000 barrels, respectively, not listed separately. These figures represent the net interest of Standard Oil in the production of the Hazelwood Oil Co., Pennsylvania, in which the National Transit Co. bought 35.9% in 1898.

Source: SONJ, Collection of predissolution data; *Mineral Resources, 1899*, 9-11, 145.

the new Kansas field. The Carter Oil Company, ranking fourth among Standard Oil's producers, was an affiliate of South Penn. Although Carter Oil's annual production in West Virginia and southern Ohio did not rise to great heights during this period, the company's dynamic leadership and present affiliation with Jersey Standard give it greater interest in this volume than its statistical position in the 1890's would justify.

Although some other corporations retained their own names as affiliates of either Forest Oil or South Penn, most of the smaller ones were merged in these parents after 1892. The decline of old pools and the reasons for the demise of some of the small producing units are illustrated by the case of the Producers' Consolidated Land & Petroleum Company. By 1895 its 256 wells, chiefly in the old McKean County field of Pennsylvania, each yielded a daily average of only two-fifths of a barrel. The corporation's capital had been reduced from $1,000,000 to $100,000 during the previous years; it did not pay for telegraphic and other services; and its officers received no remuneration except on the payroll of other Standard Oil companies. Joseph Seep, the president, signed a letter to stockholders suggesting that Forest Oil, which already held two-thirds of the shares, should purchase the rest of the stock, dissolve the corporation, and take over the property.[3] This recommendation was carried out in 1896. So ended the company whose managers years earlier had built the refinery in Bayonne which served as the nucleus of Jersey Standard.

While smaller companies were absorbed, the incorporation of The Carter Oil Company in West Virginia in April, 1893, marked the formal organization of an already active business. Standard Oil became in effect a partner, retroactively, in the operations of Colonel John J. Carter in the new Sistersville field from the date of the acquisition of his first lease in Tyler County, West Virginia, in 1889. Records do not disclose whether he was an advance scout for the large organization or whether the expansive Carter, needing capital to carry out his ambitious plans, had to turn to Standard Oil for financial aid. A few weeks after the incorporation of The Carter Oil Company, the South Penn Oil Company held 60 per cent of the original authorized capital of $1,000,000. For his leases, wells, and machinery, which had cost Carter $1,027,916.53, he was reimbursed fully by the assumption of his debts and $415,000 in cash. Simultaneously, South Penn paid Carter's operating expenses for the earlier years and was credited with an amount equal to all his previous income from the properties.[4] Carter was free of debt, held 40 per cent of the stock in the

new company, and Standard Oil had absorbed into its circle some promising, partly tested properties, and Colonel Carter.

The vigorous, egotistical, individualistic, and able Carter was quite an important addition to the Standard Oil family. Born in Ireland in June, 1842, he came to the United States in childhood. He had years of distinguished service in the Civil War before becoming a merchant and then an oil producer in the Venango and Bradford fields. Legends grew up about his luck in striking producing wells. A man of varied interests, Carter encouraged railroad building, was active in the Titusville Iron Works, and later specialized in raising fancy livestock.[5] On his record in the 1880's was his energetic fight against the Standard Oil group with which he now became associated. He met vigorously the problems of production in West Virginia, where water pressure instead of gas created a series of difficulties. Carter was known as a "pungent" speaker; he was chosen by Standard Oil to hold shares acquired in a rival pipeline, the Producers' Oil Company, Limited, and to be spokesman to oppose a proposed tax on petroleum in Ohio in 1896.

Under the leadership of its founder, The Carter Oil Company showed good results, although not without strenuous efforts. Colonel Carter bought some developed leases, but acquired a majority of his properties either in a semideveloped state or directly from the landowners. In the latter case, in addition to the usual royalty of one-eighth of the crude petroleum and a payment of $100 to $300 for each gas well, he gave a small bonus, seldom more than $50. The lease contracts, written usually for one to ten years, stipulated that they should be extended until the oil and gas were exhausted or were no longer produced in paying quantities. Carter drilled some deep, expensive, dry holes, and some wells came in only after an outlay of $6,000 to $7,000. Some West Virginia wells, drilled to 3,500 feet, were among the deepest producers in the period. Production from most wells declined rapidly and, in order to keep up the flow, new leases had to be sought constantly in promising territories near the Sistersville pool. Carter's activities spread from Tyler County into several others, including Pleasant and Doddridge in West Virginia and Monroe and Washington in Ohio. As a result of leasing efforts and success in handling difficult production problems with water pressure, Carter Oil annually averaged about 1,246,000 barrels of oil in its first seven years. The company paid dividends averaging 22.6 per cent, which were creditable if not large for a speculative operation.[6]

During the same years the South Penn Oil Company increased its

output much more rapidly. Under the driving management of Noah Clark it produced over a wide area. In West Virginia, where it had its largest operations, its output rose to almost six million barrels by 1898, and with that of Carter accounted for well over half the production in the state. Both the South Penn and its affiliate, The New Domain Oil & Gas Company, contributed to the hard-won producing effort in the disappointing fields of Kentucky.

In northern Pennsylvania and New York the Midland Division of South Penn enlarged its production both by its own active drilling and by the acquisition of large batches of partially tested leases. In 1896, in the spectacular but short-lived Chipmunk field, South Penn had eight strings of drilling tools running steadily to add new wells to its operations. In the following year the company was reported as paying the "fabulous sum" of $200,000 for a single well in Greene County. Shortly afterward the astute managers of the Midland Division, John L. and J. C. McKinney, negotiated "the largest deal ever recorded in oil producing property" to that time; for $1,400,000 South Penn bought twenty thousand acres of partly developed leases in the Ormsby, Chipmunk, and Watsonville pools of McKean County from three producing companies—Devonian Oil Company, Matson Oil Company, and Emery Oil Company.[7] Lewis Emery, Jr., one of the most outspoken critics of Standard Oil, having already sold two refineries to the combination, was again willing to accept its money for oil properties.

The motives for these sales were not always clear, although the results were. Apparently lack of harmony among managers of some producing companies caused them to offer to sell to Standard Oil.[8] The latter gained not only producing property, which brought South Penn's production in New York and Pennsylvania up from 96,000 in 1890 to a high of 1,650,000 in 1898, but also customers from rival pipelines, and hence all-important volume for its own system.

In the meantime, Forest Oil Company, managed by W. J. Young, was also acquiring some property in the Appalachian region. After the falling off of its own output in 1894, Forest made one of its largest and most important acquisitions in the following year. It took over 14,000 acres with 135 producing wells averaging 500 barrels a day in Allegheny, Washington, Butler, and Armstrong counties, Pennsylvania, from W. L. Mellon at a reported price of $500 a barrel.[9] This transfer was just part of the transaction by which Standard Oil acquired most of the oil business of the Mellons at the time.

Forest Oil Company attracted even more attention in 1897 by drilling a 5,575-foot well, which was the third deepest in the world and held the record in the United States for many years. Drilled by cable tools in West Elizabeth, Pennsylvania, the well was intended to penetrate a carboniferous limestone, an important clue to the position of the underlying Trenton of lower Silurian age, which in Ohio was rich in petroleum. Through the interest of Israel C. White, state geologist of West Virginia and consultant of Forest Oil, the well's temperatures were studied at different depths. The final fishing job for tools, however, resulted in failure and, whatever the scientific gains, Forest Oil was left with a $40,000 dry hole.[10]

Forest Oil was also the pioneer commercial producer in the Mid-Continent field. Though not in the first wave of wildcatters, it was a developer of new territory. W. M. Mills, a Pennsylvanian, had found petroleum near Neodesha in Wilson County, Kansas, in 1892. When local finances had proved inadequate to local dreams, he sold his interest to the famous team of "forerunners" and testers of potential producing territory, James C. Guffey and John H. Galey. After a considerable investment in drilling some hundred wells, in the autumn of 1895 they sold the leases and equipment in seven counties for about a quarter of a million dollars to Forest Oil.[11]

The next year witnessed a rapid development in the Kansas field. John H. Fertig was put in charge of the Kansas branch. Soon his team of experienced men were vigorously "leasing land and pushing drills." The manager took great care in selecting local lease men, acquired considerable acreage in the vicinity of his company's test wells, and engaged several drilling contractors. The excitement and bustle of a new oil field came to Kansas. Trains arrived with carloads of casing, pipe, iron for tanks, and exuberant teams of drillers from Pennsylvania. Forest Oil kept teamsters busy hauling supplies, bought timberland to obtain wood for derricks, and built machine and blacksmith shops to avoid the delay of sending drill bits to St. Louis for sharpening. Within a year the company had 129 wells, of which 76 were dry, 10 gassers, and 43 producers, and Kansas in 1896 had its biggest production for many years—over 100,000 barrels. Although shallow wells up to 850 feet cost only $2,000 to $2,500 to drill and natural gas was available for the economical batch pumping of wells with shacklerods, Forest Oil invested $750,000 before its first income came from the sale of oil in Chicago in March, 1897.[12] In the

meantime The Standard Oil Company (Kansas) was building a refinery at Neodesha.

Several local newspapers gave Standard Oil an enthusiastic welcome to Kansas. The *Wilson County Sun* remarked that "to prospect and open-up a territory . . . requires lots of nerve and lots of cash," while the *Star and Kansan* predicted that the advent of the Forest Oil Company had "marked the transition from 'wildcatting' to reliable production." Because it was known that Standard Oil was not in the "habit of casting money at the birds or spending its time in chasing unsubstantial shadows," the *Neodesha Register* credited it with establishing confidence in the new oil-producing section of the United States and thereby attracting others. The Independence *Daily Reporter* expressed the opinion that no small company could have developed the field.[13]

At the same time Standard Oil men were taking a less publicized interest in Texas. The finding of oil in the process of drilling artesian wells near Corsicana had excited a good deal of interest, and the state's production exceeded a thousand barrels by 1896. Late the following year J. S. Cullinan, a former employee of The Ohio Oil Company, went to Texas and, impressed by the opportunities, returned to Pennsylvania to get capital. After he was well launched on his work in the Corsicana region, his financial backing failed to materialize and he turned to men he knew for help. As a result of a conference in St. Louis with C. N. Payne, Standard Oil's general manager of pipelines, the partnership of J. S. Cullinan & Company was formed. C. N. Payne and H. C. Folger, Jr., supplied the needed capital, which they obtained from the National Transit Company. In 1898 the Corsicana Refining Company was organized to take over the business of Cullinan & Company and to hold a majority of the stock in a separate producing corporation, the Corsicana Petroleum Company.[14]

J. S. Cullinan's work covered all functions of the industry. In the new field the Corsicana Petroleum Company was second only to the Southern Oil Company in production, although many others entered this phase of the industry. The ease of drilling through soft formations "with a specially constructed machine known as a rotary drill" added new interest in the field, as did the method of forcing water to the bottom of a hole to wash up the loosened material outside the tubing. Wells were reported completed in ninety-six hours at a cost of only about $1,500. Backed by adequate capital, Cullinan constructed "mammoth storage tanks," bought, piped, stored, and marketed a large quantity of the production for fuel purposes, and in 1898 started to build the Corsicana Refinery.[15]

Meanwhile, the production of The Ohio Oil Company in the Lima-Indiana field was of major importance to all refineries running on sour crude, including Jersey Standard's Bayonne plant. Since Ohio Oil's general manager, William Fleming, continued to live in Oil City, C. F. Lufkin was in charge in the field, except when he went to the Dutch East Indies in search of new producing property for Standard Oil in 1892 and 1897. While the Ohio Company bought up developed territory, it also acquired some leases directly from farmers for the accustomed royalty of one-eighth or one-sixth of the oil and bonuses up to one hundred dollars an acre. From 1893 on, Ohio Oil speeded up its activities in Indiana, and three years later it gave an early fillip to new explorations in southern Illinois by taking some leases in that as yet undeveloped area.[16] For the period as a whole it was the most important single producer in the Standard Oil family.

All the Standard Oil producing companies had their share of the usual difficulties in leasing, drilling, and completing wells and lifting crude. Damage from storms and fires, hauling supplies over bad roads, and drilling dry holes as always were part of the cost. No amount of care in leasing could prevent competitors from drilling offsetting wells on neighboring leases, or rival contenders from fighting either in court or in person over disputed territory. There were also long-drawn-out legal duels with lessors over the terms of contracts, particularly as to the rate at which the property should be developed.[17] A more detailed study of The Ohio Oil Company with its large contiguous leases might well provide an early example of the advantages of widely spaced wells accompanied by savings in drilling costs and more economical use of gas pressures.

Although the methods of the producing companies within the Standard Oil combination differed widely, as did the areas of operation and the problems faced, the companies benefited not only from the improved techniques of the nineties but from their sharing of information. When the general managers of South Penn, Forest Oil, and Ohio Oil visited Fertig in the Kansas field, they gave advice and gathered data.

Producers continued to make marked improvements over the pioneering methods of Drake and his contemporaries. Well records were more carefully kept, and experience proved instructive. In many places, using improved tools, two shifts of two men each could drill two hundred feet in a day. At Corsicana producers employed the rotary drill. Progress was made in completing wells, such as in cutting off caving and water seepage by the use of cement. Standard Oil had the patent for the Van Dyke-Frasch method of increasing the flow of a well by the use of hydrochloric

acid and that for Tapley W. Young's method of stimulating wells by an electric heater. Contemporary writers credited Forest Oil with a number of developments in Pennsylvania, among them being the use of Thomas Gallagher's device for cleaning wells to increase their flow. In Kansas, Forest Oil experimented with windmills for pumping, then used natural gas for power. Whoever first used electricity for the batch pumping of wells, Carter Oil was proudly employing a "Westinghouse Dynamo" for the purpose in the nineties.[18] The Standard Oil companies were able to hire skilled drilling contractors, employ the leading geologists of the day, and experiment with new methods, and all information was pooled.

The statistical results of Standard Oil's production policy show a change in its relative position in different fields. Although for the whole period Ohio Oil was the largest single producer in the Lima-Indiana field, as in the Standard Oil combination, its proportion of the output in that area dropped from 56 per cent in 1890 to 36 per cent in 1898. After 1894 the total of all Standard Oil producing companies in the Appalachian area exceeded the output of The Ohio Oil Company. The combination's percentage of production of Pennsylvania-grade oil rose from 13 per cent of the total in 1892 to 36 per cent six years later.[19]

Never before and never again did the Standard Oil combination occupy such a relatively high position in production in the United States as during the nineties. The total output of the country for the three years 1897 to 1899 exceeded that for 1889 to 1891 by 27 per cent. As figures in Table 25 show, the net production of Standard Oil reached a high of 18,549,000 barrels for the period in 1898. This accounted for 33.5 per cent of the output in the country. The net production figures, though the only ones now available, understate Standard Oil's production. The royalty oil owned by lessors, though deducted from Standard Oil's gross production to find net production, was actually produced by the combination. In 1898 Standard Oil's gross production, assuming a royalty of one-eighth, accounted for over 38 per cent of the total in the United States and satisfied more than 40 per cent of the needs of the combination's own refineries. On receiving a detailed report from Archbold the previous year, Rockefeller agreed that the results of going into production less than ten years earlier were "most gratifying."[20]

PURCHASING AND PIPING

Both before and after Standard Oil entered production Rockefeller and his associates had found their purchasing policy of crude oil

unsatisfactory. As discussed above, for petroleum received by its pipeline system in the Appalachian field Standard Oil issued certificates which were traded on the oil exchanges. Neither the producers nor Standard Oil were content with the resulting fluctuations of prices during the late 1880's. The combination's experiment with issuing certificates in the Lima-Indiana field failed, and it purchased there by posted prices. The executives considered extending this practice to the Pennsylvania field in 1890, but the majority agreed with William Rockefeller, who feared that the change "would be a very disturbing and unsettling thing and create a great howl."[21]

By early 1895 Standard Oil managers had decided that it was time for a change. Even in the depression years of the early 1890's, while production of crude in the Appalachian area fell off, consumption was growing and the amount of Pennsylvania-grade oil in storage diminished; in 1895 stored oil reached a new low of less than five million barrels compared with more than eighteen million in 1892. That fact, coupled with the absence from the open market of Standard Oil's own growing production, drastically reduced the number of certificates available for trading on the oil exchanges. At the same time, the general financial depression in 1893-1894 resulted in limited speculation in oil certificates and in relatively low prices, which in turn reacted on production. The extraction of Appalachian-grade crude fell steadily from 1892 to 1895. On January 23, 1895, Joseph Seep, Standard Oil's purchasing agent in the Oil Regions, made the following announcement:[22]

Notice to Oil Producers

The small amount of dealing in certificate oil on the exchanges renders the transactions there no longer a reliable indication of the value of the product. This necessitates a change in my custom of buying credit balances. Hereafter in all such purchases the price paid will be as high as the markets of the world will justify, but will not necessarily be the price bid on the exchange for certificate oil. Daily quotations will be furnished you from this office.

JOSEPH SEEP

Thereafter, when a producer ran his crude petroleum into a Standard Oil pipeline, managers of the latter used a modification of earlier practices, discussed in Chapter 4, to transfer ownership of the oil to refineries. When the producer deposited his oil with a pipeline, he was given a run ticket to represent his credit balance. If he sold his oil within thirty days, there was no storage charge. Seep purchased balances at the price quoted by Standard Oil for the grade of oil represented on the date of sale and

transferred the credit balances to the account of Henry Lewis, Crude Purchasing and Carrying Department (formerly Crude Stock Department) of Standard Oil Company of New York. That department sold crude oil to refineries at the posted price as of the date of purchase, plus transportation charges and a commission of one-fourth cent per barrel.[23] The pipelines carried the petroleum. Jersey Standard's refineries and most of the others in the Standard Oil group purchased oil by this method.

For some time any producer who had a thousand barrels of crude to sell could still receive the price quoted on the oil exchanges. The Seep Agency stood ready to negotiate the sale free of charge at the average price of sales for the day, undoubtedly to fulfill the promise made to producers in 1880. Thus, in late 1898, when quotations on the exchanges ran higher than posted prices, the producers took the opportunity to sell on the exchanges. For the most part, however, those prices followed quotations of Standard Oil and other buyers of crude petroleum. Dealings in oil certificates fell off; in 1896 the Titusville Exchange closed, and the others followed within a few years.[24]

The combination's new policy, coupled with improved economic conditions, resulted in higher prices than before and in increased production. Standard Oil's posted prices in 1895 were well above previous levels; the monthly average price for Pennsylvania crude in the initial months of the new policy was more than a dollar for the first time since February, 1890. The average for 1895 was $1.37. The *Paint, Oil & Drug Review* predicted that the policy would "revolutionize the business," which, ceasing to be a subject of "merely speculative transactions," would "engage the attention of economists and legitimate investors to a greater extent than ever before."[25] Certainly the next two years were active ones in the Appalachian regions. They were characterized by newspaper writers as those of the "festive wildcatter" and as marked by "restless excitement," a "scramble for territory," and the "renovating" and cleaning out of old wells.[26]

Though Standard Oil's policy, by raising the price of crude oil in the Appalachian area, undoubtedly had the effect of encouraging increased production, it also gave Standard Oil competitive advantages. It was coincidental with, if not inspired by, the first strongly integrated rivalry the combination experienced in that area. By offering higher prices for Appalachian petroleum Standard Oil pleased the independent producers. It raised its own costs on the reduced supplies of Pennsylvania-grade oil which it purchased from nonaffiliated producers, but it also increased the

cost for its Pennsylvania competitors' purchased supplies. The prices offered for crude oil by the two large buyers in the Appalachian area—Producers' & Refiners' Oil Company, Limited, and Standard Oil—manifested one phase of their rivalry.

To take care of the growing production of petroleum of the United States, the pipeline men gradually extended their system and slightly reorganized their lines. According to their statistics, by 1899 their trunk mileage was 3,905 and gathering lines accounted for 10,749, making a total of 14,654. Entrance into Kansas production had been followed by construction in that area. The Indiana Pipe Line Company had added to its properties both by new construction and by purchases of the gathering lines in its state of domicile from a sister company, Buckeye, which, experiencing problems growing out of its lack of the right of eminent domain in Indiana, restricted itself to Ohio.[27]

The pipeline interests of Standard Oil made one major acquisition during this period. W. L. and H. W. Mellon's activities in the petroleum industry had given rise to a competition which the Standard Oil group found very disconcerting, especially in foreign trade, as discussed in Chapter 9. During the panic year of 1893 the Mellons sold out not only some of their producing interests in Pennsylvania but their holdings in refining, an English marketing and shipping corporation, and, most important, their pipeline system. On August 9 the Mellons agreed to a future sale of 45 per cent of their stock in six petroleum companies to H. H. Rogers. A similar contract with two other men—Frederick P. Olcott and Frederick Cromwell—covered the other 55 per cent. Both contracts were acquired by the National Transit Company on November 9, 1895, after a change in Pennsylvania law had made its acquisition of competing pipelines possible. The sale included the Mellon pipeline of Pittsburgh, embracing some 325 miles of gathering system extending through Allegheny and Washington counties in Pennsylvania into the Sistersville field, 100 miles of trunk line from Sistersville to Pittsburgh, and The Crescent Pipe Line, with its 300 miles, which had run its first oil from Pittsburgh to the seaboard at Marcus Hook in November, 1892. The South-West Pennsylvania Pipe Lines took over the gathering lines in Pennsylvania. The purchase from the Mellons was the only sizable addition to the pipeline system of Standard Oil not built by its own affiliates.[28]

With the aid of the courts Pure Oil thwarted the efforts of Standard Oil men to get an effective voice in the management of two pipeline companies associated with Pure Oil. In 1897, in the case of *National*

Transit Company and J. C. McDowell v. *United States Pipe Line Company,* the judge decided that National Transit's representative, McDowell, had the right to vote the stock held in the defendant company. The minority holding, however, gave him a very small voice in the affairs of the competing trunk line. When Standard Oil's new associate, Irishman J. J. Carter, the majority stockholder of the Producers' Oil Company, Limited, tried to attend one of the meetings of that Pure Oil affiliate, Irishman Michael Murphy summarily excluded him as an interloper. A Pennsylvania court later upheld the validity of the bylaws of the Producers' Oil Company, Limited, which restricted the privilege of voting its stock to those elected by a majority of its members.[29] The Pure Oil group was definitely established as a permanent rival of Standard Oil.

EXPANDING AND IMPROVING THE REFINING OF SOUR CRUDE

Efforts of Standard Oil manufacturers during the 1890's centered on meeting several new conditions. These were the increasing relative importance of Lima-Indiana crude in Standard Oil supplies, the technological changes instituted in connection with the processing of sour petroleum, and the remarkable shifts in consumption of petroleum products growing out of world-wide depression and competition abroad from the Nobels, Rothschilds, Marcus Samuel, Royal Dutch, and lesser rivals.

A whole complex of considerations harassed Standard Oil executives during the 1890's. In spite of depression in the early years of the decade, over the period as a whole the growth in demand for illuminating oil and lubricants encouraged an increase in the capacity of Standard Oil refineries and lubricating oil works. This in turn posed the possibility of an excess of naphtha products, especially gasoline. The high gasoline content of Lima-Indiana crude further complicated that problem. At the same time, the apparent downward trend in the supply of Pennsylvania-grade petroleum strongly suggested the desirability of placing greater reliance upon sour crude as a raw material. Competitive conditions abroad also called for utilization of the low-cost Ohio crude if kerosene therefrom could be made acceptable for export, but to accomplish this end manufacturing processes had to be improved. Full use of the various fractions of Lima-Indiana oil would also confine sales for industrial fuel to residuum, so-called "reduced oil." This might mean difficulties in meeting orders for fuel oil in the Middle West, where a market was already

developed, while the processing of sour crude in quantity on the Atlantic seaboard might develop a surplus of fuel oil in the Eastern markets, which were undeveloped.

Recommendations on these problems emanated from the Manufacturing Committee, relatively unchanged in constituency and in policies. As far as has been ascertained, the committee continued through the nineties with substantially the same membership that it had at the beginning of 1892.[30] The aging but still vigorous Ambrose McGregor headed it. He was always aided by the unobtrusive F. Q. Barstow and by a steady stream of advice from such field representatives as James A. Moffett, W. P. Cowan, John W. Van Dyke, and others. An increasingly impressive figure in the committee was the calmly efficient H. C. Folger, Jr., who had become its secretary as early as 1886.[31] As might be expected in view of the slight changes in constituency, the committee consistently pursued the policies of consolidating, concentrating, and economizing initiated in the 1870's and 1880's.

Standard Oil executives purchased few competing refineries during the 1890's, and then usually for a variety of reasons not entirely related to elimination of outside refining capacity. The plants of Bear Creek Refining at Marcus Hook and Pittsburgh were acquired in 1895 in connection with the deal for purchase of producing, transporting, storing, and marketing facilities of the Mellons, a primary goal apparently being to shut off the competing supply of crude oil to the French Refiners. During the same year the purchase of the Mutual, Union, and International Oil units at Titusville and at Reno had as a major result the acquisition of stock in three pipeline affiliates of Pure Oil.[32]

Acting with the approval of the Executive Committee, McGregor and his associates supervised the closing of the new acquisitions and several old refineries. Both the Empire and Central plants remained inoperative throughout the years 1892-1899, though neither was dismantled. The Acme Works at Titusville last appeared in the accounts of Standard Oil Interests in 1892, the Imperial Works at Oil City in 1895, and the Bush & Denslow plant in Brooklyn in 1897, though all had ceased operations from two to four years earlier. All the refineries acquired in 1895 were dismantled, some of the equipment from the Titusville plants going to a new unit in Kansas.[33]

The Neodesha Refinery of The Standard Oil Company (Kansas) began operations in 1897.[34] A small five-hundred-barrel plant, it utilized Kansas crude of the Forest Oil Company and manufactured petroleum products

for distribution in Kansas and near-by states. The location and size of the plant enabled it to take full advantage of inexpensive raw material and low transport costs for both crude oil and finished products. That locational policy of having some small plants to cater to local markets was essentially the one which enabled the Olean, Parkersburg, and Lima units of Standard Oil Interests to remain in operation. Some Standard Oil men followed the same principle in beginning the construction of a refinery at Corsicana in Texas late in the nineties, although that plant was not operating prior to 1899. Kansas Standard's refinery was the only new one to begin manufacturing during the years just prior to the Jersey Company's becoming the parent of the Standard Oil family.

While closing and dismantling some plants and starting to operate one new one, Standard Oil executives were concentrating expansion in less than half a dozen of their refineries. In 1897, the last year of the decade for which data on all plants in the combination are complete, the Whiting Refinery of Indiana Standard accounted for 22 per cent of the throughput of all Standard Oil refineries. Whiting and Atlantic Refining's Philadelphia unit together put through 43 per cent of the total, and the figure was raised to 53 per cent when Jersey Standard's Bayonne plant was added. By including the Long Island Refinery and the Sone & Fleming Works of New York Standard the percentage was raised to 67. Five plants ran two-thirds of the crude utilized in all the twenty-two processing units of the Standard Oil group, exclusive of compounding plants.[35] As indicated in Table 26, Standard Oil "consumption" of crude, which is an approximate measure of throughput, rose ten million barrels between 1892 and 1898, but a drop occurred in the following year.

Table 26 CRUDE OIL CONSUMED[a] ANNUALLY BY ALL STANDARD OIL REFINERIES IN THE UNITED STATES, 1892-1899
In barrels of 42 gallons

Year	*Consumption*
1892	38,657,489
1893	41,083,324
1894	42,491,057
1895	40,772,168
1896	43,356,290
1897	48,068,430
1898	48,679,239
1899	45,847,279

[a] Standard Oil's statistics of crude oil consumed included that sold by it to outsiders.
Source: *U.S.* v. *SONJ*, XIX, Defendant's Exhibit No. 267.

Much of that expansion was achieved by additional processing of Lima-Indiana crude. By 1896, the stored and new oil from the tanks of The Buckeye Pipe Line Company was moving to the three largest plants in the Standard Oil family—those of Indiana Standard at Whiting, of Atlantic Refining at Philadelphia, of Jersey Standard at Bayonne—and to three smaller ones, that of Ohio Standard at Cleveland, that of Solar Refining at Lima, and that of New York Standard at Olean. Ohio Standard's conversion began in 1890, when a drop of almost 50 per cent in its output emphasized that the Cleveland Refinery was so old-fashioned that it was, in the words of F. B. Squire, "almost a monstrosity." Between that date and 1896 the entire refinery, including the paraffin-pressing plant, the tin can factory, and lubricating oil works, was almost entirely reconstructed at a cost of about $300,000. The Olean unit shifted to sour crude in 1893, the Philadelphia and Bayonne plants later.[36]

Expansion of sour crude processing in the East occurred only after the manufacture of a marketable illuminating oil from Lima-Indiana crude had been assured by improvements in technology and skills on the part of foremen, superintendents, and chemists. At the No. 1 Works of Ohio Standard, Utley Wedge designed a furnace for removing oil from the used copper oxide compound before it was sent to the revivifying roasting ovens. Wedge's method saved the 8 per cent loss of copper oxide suffered under the former practice of burning out residual oil in open pits. Experience at Lima, Cleveland, and Whiting taught technicians that the compound should be ground very fine before being put into the "sweetening" stills. At Lima an elevated track with push cars was built to carry the compound to the manholes of the stills. Frasch adopted many improvements made by others and developed some himself. Standard Oil officials called upon him for consultation and advice not only when instituting his process at Olean, Philadelphia, and Bayonne, but also after operations were in full swing. Sometimes the inspectors and chemists of the various plants assembled for a conference on the common problems.[37]

It is significant that Standard Oil men did not urge the New York Produce Exchange to accept kerosene manufactured from Lima oil for export until September, 1895. Proponents of the change won their point even then only over the strenuous protests of oilmen from Pennsylvania.

Data on the Bayonne Refinery afford a case study of many changes. Throughput of the plant rose from 3,132,602 barrels in 1892 to 7,005,358 seven years later, having reached a peak of 8,090,215 in 1898. Between 1893 and 1899 the volume of kerosene manufactured increased from

2,686,735 barrels to 4,170,286. Expansion began in 1893 with the addition of ten crude stills. As Table 27 indicates, conversion to processing sour crude got under way two years later. Between 1893 and 1898 forty new crude stills and all the supplementary appliances were set up. Bayonne's output continued to be primarily for export trade; domestic consumption took only 26 per cent of its delivered kerosene in 1899. More than 88 per cent of deliveries to home trade were Water White, while almost 83 per cent of those for export were Standard White grades.[38]

Table 27 ANNUAL THROUGHPUT OF BAYONNE REFINERY STANDARD OIL COMPANY (NEW JERSEY), 1892-1899
In barrels of 42 gallons

	Actual Crude Consumed		*Crude*	*Total*
Year	*Pennsylvania*	*Lima-Indiana*	*Equivalent*	*Throughput*
1892	3,105,533		27,068	3,132,601
1893	3,587,266		73,054	3,660,370
1894	3,893,710		46,700	3,940,410
1895	2,829,580	330,632	50,870	3,211,082
1896	102,979	3,848,394	2,593	3,953,966
1897	2,630,291	2,133,797	62,047	4,826,135
1898	920,003	7,132,359	37,853	8,090,215
1899	76,876	6,678,064	250,438	7,005,378

Source: SONJ, Bayonne Cost & Yield Statements, 1892-1899; Consol. Accts. of S. O. Interests, Analysis of Business, Bayonne Refinery, 1899.

To facilitate the use of Lima-Indiana crude, experts were brought to Bayonne from Midwestern plants in 1896. C. I. Robinson, formerly of Solar, took charge of a new testing laboratory, for which equipment had been purchased before his arrival. G. W. Van Winkle was replaced as superintendent of the refinery by George P. France, who came fresh from several years of dealing with sour crude in the same capacity at Whiting. With him arrived B. H. Lepley, whose experience with sulphur-bearing petroleum and the Frasch process at Lima, Cleveland, and Sarnia made him an excellent choice as head of the "sweetening" plant at Bayonne. Conflicts of jurisdiction ensued between the two groups involved in the refinery—refining proper under France and the mechanical department under the direction of J. H. Alexander, who also exercised general supervision over all refining operations in the New York area. Nevertheless, expansion of throughput and products increased, and Utley Wedge merged the two departments at Bayonne when he became superintendent in

1899.[39] By that time only a small amount of Pennsylvania-grade oil was being run.

Other changes at Bayonne in the nineties reflected the day-to-day efforts of Standard Oil men—executives and plant officials alike—to reduce costs and to improve processes. In accordance with practice instituted as early as 1885, new crude stills were aligned in units of five, with one condenser box serving each group. The most modern cranes and fire-protection equipment were installed and new office buildings erected. Plant men converted twenty-six stills and several steam boilers to the use of residual gases for fuel in 1892, and then back to coal and fuel oil four years later when relative costs changed. A writer in the *Paint, Oil & Drug Review* in 1899 noted the "wonders" Standard Oil chemists had accomplished in the utilization of sludge acid during the past ten years. Measures to raise the quality and quantity of lubricants and wax are discussed in Chapter 16. At The Bergenport Chemical Works managers effected economies in manufacturing sulphuric acid by utilizing gas for fuel, instituting a laboratory, and expanding capacity by building a secondary Gay-Lussac tower and installing new burners. They concluded an agreement in 1898 with the Pratt Process Company of Atlanta, Georgia, for use of its improved apparatus and process, which were also adopted at Whiting. In fact, Standard Oil produced good sulphuric acid at Bayonne and other points so cheaply that competitors in the petroleum industry testified that they preferred to buy their supply, needed for treating products, from their arch-opponent rather than from commercial producers.[40]

In 1893, near the Lower Yard where many of the additional facilities were set up at Bayonne, Jersey Standard officials started a plant which ultimately became the largest establishment in the world for fabricating cans and cases and filling them with petroleum products. Some of the first equipment was taken from the Devoe Works, though that plant was still making and filling sixty thousand cans and thirty thousand cases per day in 1895. Most of the machinery at Bayonne, however, was new—shapers, lathes, pressing and cutting machines, color printers, shears, soldering apparatus, and filling machines. Although Standard Oil still imported some of its tin plate from the United Kingdom and received a drawback upon re-export, by the end of the century increasing amounts were purchased from domestic manufacturers favored by the tariff acts of the 1890's.[41]

A telephone system, installed at Bayonne in 1897, saved time for both

workers and managers. The letter of instructions for its use vividly calls to mind both human frailties and some of the vagaries of the mechanical elements before 1900. Signed by Superintendent France, it read:[42]

> Please comply with the following instructions as to use of the instrument. To call Central Office give bell crank one sharp turn; then take telephone from hook, place it firmly against the ear and listen for operator who should answer "What Number?" The operator will then repeat back your request in order to avoid error and expedite service. When you are through talking return hand telephone to hook; give bell crank one sharp turn to notify operator that you have completed your conversation.
> *Please answer your calls promptly.*

Meanwhile, Standard Oil manufacturers tested ideas of scores of aspiring inventors. Hopes of financial rewards induced men from all over North America and Europe to submit ideas to the Manufacturing Committee for improvements in distilling, refining, deodorizing processes, use of waste products, and such equipment as pumps, valves, cooling systems, motors, tanks, and pipes. These petitions either desired Standard Oil to subsidize the inventors or to help organize a company to manufacture the improved machinery. As secretary of the committee, Folger always answered courteously, explained that Standard Oil would never have anything to do with a process or mechanical invention until it was patented, and if that requirement was met he would be glad to have tests made. Until after 1900 he consistently sought methods for improving techniques in refining Lima-Indiana petroleum, but, as W. M. Burton testified later, nothing better than the Frasch process was found, either for economy of operation or quality of product on a large-scale basis.[43]

Standard Oil apparently made technical contributions generally commensurate with its pre-eminent position in the American petroleum industry. Several small refiners testified before the Industrial Commission in 1899 that they believed Standard Oil possessed a great advantage in having the financial resources to develop by-products more than they themselves could, though the unyielding Lewis Emery, Jr., refused to agree with that opinion. Probably the most balanced judgment on the subject was given by Theodore B. Westgate, a director of Pure Oil: "I believe . . . that the Standard Oil Company is employing the very best brains engaged in the manufacture of oil. They have certainly brought forward a great many inventions in the refining of crude petroleum. I certainly believe that. A man can not help but see that they are improving every day. They are doing a great deal to bring out the very best there

is in crude oil and make the most of it. That is their business. They probably do more than any man or any firm."[44]

Modifications of Jersey Standard's manufacturing establishments pointed to the growing importance of by-products in the operations of the combination as a whole. By adding equipment the Eagle Works, which specialized in lubricants, was enabled to consume 40 per cent more crude oil in 1897 than in 1893. The comparable figure for the Baltimore plant was 67 per cent, but the crude oil consumption of the Camden Works at Parkersburg rose only slightly more than ten thousand barrels during the period. A large part of the Baltimore Refinery burned and was rebuilt in 1895, twenty-four new shell stills being constructed and facilities for preliminary processing of residuum being added. Although in 1897 the Eagle Works listed fuel oil as the only new product since 1893, the other two refineries mentioned added that item and mineral seal oil, gas oil, acid oil, roofer's wax, paraffin distillate, tank cleanings, and tar-still coke. If the consumption of these three units is added to that of Bayonne in 1897, Jersey Standard plants accounted for 19 per cent of the crude oil processed by all Standard Oil establishments, and together they manufactured almost the entire range of petroleum products, except specialties.[45]

The most significant result of the changes made by Standard Oil refiners in the 1890's was the increase in volume and value of the so-called major by-products. In 1890 gas oil was not sold in sufficient quantity to be separately listed in analyses of manufacturing, but in 1897 refiners produced 842,320 barrels valued at $777,932. Table 28 shows the changes in five other products. While the manufacture of kerosene was rising

Table 28 QUANTITIES AND VALUES OF KEROSENE AND MAJOR BY-PRODUCTS DELIVERED BY ALL STANDARD OIL REFINERIES ANNUALLY, 1890 and 1897

	Volume In barrels of 42 gallons		*Value*		*Percentage of Increase from 1890 to 1897*	
	1890	*1897*	*1890*	*1897*	*Volume*	*Value*
Kerosene	17,233,543	26,334,599	$37,441,815	$39,239,263	52.7	4.8
Naphtha	3,607,619	5,908,360	5,763,416	7,781,641	63.7	35.0
Fuel Oil	780,159	6,597,792	367,193	3,941,315	745.6	973.3
Lubricating Oil	952,345	1,737,044	3,785,218	5,798,491	82.3	53.1
Wax	267,474	492,755	920,281	2,742,968	84.2	198.0

Source: SONJ, Consol. Accts. of S. O. Trust, 1890, and of Standard Oil Interests, 1897.

52.7 per cent in volume and 4.8 per cent in value between 1890 and 1897, sales of residual oil for fuel increased 745.6 per cent in volume and 973.3 per cent in value. The gain of the latter was emphasized by the fact that fuel oil now ranked second in volume among all Standard Oil products. Whereas kerosene accounted for 69.7 per cent of the refiners' total revenues of $50,024,969 from products in 1890, the proportion had dropped to 59.9 per cent of $63,270,323 seven years later.[46]

BULK MARKETING OF OLD AND NEW PRODUCTS

Under the watchful eye of the Executive Committee, particularly of W. H. Tilford and C. M. Pratt, domestic marketers strove to adjust their operations to the shifting pressures of the manufacturers and of the market during the years 1892-1899. The Domestic Trade Committee and field men of all types took on the task of maintaining their volume of sales in the face of competition and depression during the early years of the period and then tackled the problem of disposing of the prevailing plethora of naphtha, fuel oil, and lubricants produced by seaboard plants after 1895.

As a result of the reorganization of Standard Oil affairs in 1892, Jersey Standard rose to be one of the nine large wholesaler-jobbers among Standard Oil Interests. The others were Atlantic Refining, Continental, Waters-Pierce, and the Standard Oil units incorporated in New York, Kentucky, Ohio, Iowa, and Indiana. Of those nine, the Jersey Company held all the shares belonging to Standard Oil Interests in Continental, Iowa Standard, and Waters-Pierce. Table 29 shows the territorial allocations of the nine companies on April 1, 1892, and subsequent alterations during the ensuing seven years. Notably, to Jersey Standard were transferred in 1892 the marketing facilities of Baltimore United, with its trade-mark of "Aladdin Security Oil."[47] To these and properties in northern New Jersey were added stations in southern New Jersey and Delaware two years later and other units in North and South Carolina, Georgia, and Florida in 1896. Not only was the Jersey Company selling petroleum derivatives on its own account from New York Harbor to the Florida Keys, but it was also vitally interested in corporations marketing Standard Oil products over much of the West and Southwest.

Numerous changes in personnel accompanied the shifting character of marketing in the 1890's. George F. Gregory left the Domestic Trade Committee to apply his knowledge to foreign trade, while C. M. Coburn, W. R. King, Walter Jennings, and H. M. Tilford assumed more influential positions than earlier in home-trade operations. While some domestic

marketers were leaving Standard Oil, especially salesmen in the West and South, others moved up the managerial ladder. One of Jersey Standard's later directors, T. J. Williams, had entered the combination's employ when the Acme Oil Company purchased the Jermyn Oil Company of Wilkes-Barre, Pennsylvania, in 1885. He was appointed treasurer of Baltimore United in 1889 and acted as general manager in Baltimore until chosen as traveling representative of the Domestic Trade Committee in 1897. Thomas Goodwillie, whose oil business in Cleveland had been absorbed by Ohio Standard in 1885, succeeded Williams as general manager in Baltimore and served the growing business there until 1919.[48]

Shifts in territorial allocations and expansion of facilities led managers of the various companies to make frequent modifications in administrative organization. Between 1894 and 1896 Jersey Standard's territory was divided into three segments—Baltimore, southern New Jersey and Delaware, and northern New Jersey, the last-named still being managed by the Domestic Trade Department of New York Standard. In 1896 all stations north of Delaware were consolidated into the New Jersey and Delaware Division, those in Maryland and to the south remaining in the Baltimore Division. Under the division managers served numerous district and city managers, while agents, subagents, and some hidden companies[49] operated the increasingly numerous bulk stations, from which ranged tank-wagon men and specialists in selling lubricating oils, gasoline, fuel oil, and such shelf goods as axle grease, liquid gloss, and sewing-machine oil.

By the 1890's administrators had developed quite elaborate controls over the activities of the salesmen. Monthly and semiannual reports came to 26 Broadway from division heads, who in turn required reports for even shorter periods from their subordinates and salesmen. Tank-wagon drivers reported daily. With the aid of a manual, the B. & M. (Barreling and Marketing) Reports were made on well-developed and frequently revised standardized forms. Executives at all levels sedulously compared costs, including those for the maintenance of horses and mules. Auditors carefully examined the books of managers and agents, who were bonded. In addition, armed with some forty questions to check efficiency, cleanliness, and safety, inspectors regularly visited all bulk stations. All these measures made certain that the all-important corporals and privates of the Standard Oil organization, the tank-wagon drivers and agents, kept on their toes.[50] Records showed when an agent failed to drum the trade efficiently—to visit customers often in order to make sure that wagons were calling at the proper intervals and that the oils were giving

Table 29 CHANGES IN TERRITORIAL ALLOCATION OF OWNERSHIP OF STATIONS BY LEADING STANDARD OIL DOMESTIC MARKETING COMPANIES, 1892-1899

Company	Marketing Territories as of April 1, 1892	Transfers of Territory: Acquired	Transfers of Territory: Relinquished
Atlantic Refining Company, The[a]	Pennsylvania, Delaware, southern New Jersey, western Maryland, southwestern Ohio, and part of West Virginia		1894—to Jersey Standard—southern New Jersey and Delaware
Continental Oil Company	Colorado, Wyoming, eastern Montana, Utah, and New Mexico		
Standard Oil Company (Indiana)[b]	Northern Illinois, Minnesota, Wisconsin, North Dakota, western Ontario, Manitoba, Saskatchewan, and Alberta	1896—from Standard Oil Co. (Ky.)—northern Missouri, Iowa, Nebraska, and Kansas Aug., 1899—from The Standard Oil Co. (Ohio)—northern Indiana, and Michigan	1898—to The Imperial Oil Co., Ltd.—western Ontario, Manitoba, Saskatchewan, and Alberta
Standard Oil Company (Iowa)	Arizona, California, Nevada, Idaho, Oregon, Washington, western Montana, British Columbia, Hawaii, and Alaska		1898—to British Columbia Oil Co., Ltd.—British Columbia
Standard Oil Company (Kentucky)[b]	Western North Carolina, western South Carolina, Georgia, Florida, Alabama, Mississippi, Kentucky, Tennessee, southwestern Ohio, southern Indiana, southern Illinois, northern Missouri, Iowa, Kansas, Nebraska, and South Dakota		1896—to Standard Oil Co. (N. J.)—western North Carolina, western South Carolina, Georgia, Florida; and shares in Tide Water Oil Co. of Georgia, The Standard Oil Co. (Kan.), and Standard Oil Co. (Mo.) 1896—to Standard Oil Co. (Ind.)—northern Missouri, Iowa, Kansas, Nebraska, southern Indiana, southern Illinois, and South Dakota

Standard Oil Company (New Jersey)[b]	Northern New Jersey, Maryland, District of Columbia, Virginia, eastern North Carolina, eastern South Carolina, and West Virginia (Charleston, Huntington)	1894—from The Atlantic Refining Co.—Delaware and southern New Jersey 1895—absorbed property of New Jersey Oil Company (liquidated) 1896—from Standard Oil Co. (Ky.)—western North Carolina, western South Carolina, Georgia, and Florida; and shares in Tide Water Oil Co. of Ga., The Standard Oil Co. (Kan.), and Standard Oil Co. (Mo.) 1897—absorbed properties of Tide Water Oil Co. of Ga. (liquidated)	
Standard Oil Company of New York[b]	New York, New England, and agency in Montreal		1898—to The Imperial Oil Co., Ltd.—agency in Montreal
Standard Oil Company (Ohio), The[b]	Northern and central Ohio, northern Indiana, and Michigan		Aug., 1899—to Standard Oil Co. (Ind.)—northern Indiana, Michigan
Waters-Pierce Oil Company[b]	Southern Missouri, Arkansas, Oklahoma Territory, western Louisiana, Texas, and Mexico		

[a] Though 74.8% of the stock of the Capital City Oil Co., a tank-wagon distributing unit in Harrisburg, Pa., was held by Jersey Standard, the business was operated in conjunction with the marketing activities of The Atlantic Refining Co. The latter also owned and operated tank-wagon stations in Frederick, Cumberland, and Hagerstown, Md., Steubenville, Ohio, and Wheeling, W. Va.

[b] In addition to stations under their own names, almost all these companies owned, in whole or in part, shares in small marketing firms within their territories.

Source: SONJ, Consol. Accts. of S. O. Interests, 1892-1899, and balance sheets, trial balances, inventories, and miscellaneous papers of companies in the Standard Oil group, 1892-1899; Salary Bks. A, B, and C, and Corp. Recs., charters, and miscellaneous papers of various companies; W. F. Taylor, "History," 94-97, 187-188, 193-194, 232-233, 235-236, 237-238.

satisfaction. Complaints as to quality of oil were investigated even to the extent of going to a consumer's home to test the product.

In disposing of their wares during the nineties, Standard Oil marketers in general extended the application of policies and practices initiated earlier. Innovations were few. Moving nearer the consumer was the goal.

The supply pattern for bulk stations changed little between 1892 and 1899. Products moved from Eastern refineries in the same channels as earlier. The Whiting Refinery maintained its overwhelming dominance in the trans-Allegheny region: the dismantling of the Imperial Works at Oil City, the static capacity of the Camden Works at Parkersburg, the relatively small extent of operations in Pittsburgh, and the reduced capacity of the rebuilt Cleveland plant all testified to Whiting's advantages in size and location. The small Neodesha Refinery supplied only a limited area, and the decision of Iowa Standard to get some of its supplies from native California refiners[51] did not entirely stop the flow to the Western marketer from Indiana Standard.

As the volume of sales grew, Standard Oil companies added to their bulk transport facilities on land and water. By 1898 the Union Tank Line, managed by Howard Page and M. A. Robinson, owned 5,851 tank cars, or 44 per cent of the 13,271 in the United States. Far Western overland deliveries to bulk stations were made in special patented cars with oil tanks at both ends and space in the middle for dry freight. Eastern shipping units added tugs, lighters, and barges to their facilities. New York Standard adopted steel tank barges after 1892, and they were being used on the Great Lakes three years later. On the same body of water experiments were made in shipping by tanker, and increased use of this method was made after 1895, when two steel tankers were ordered.[52]

Slowly in the depression years and rapidly during the prosperous late nineties, Standard Oil took over the function of delivering petroleum products to retailers. Most progress in this process was achieved through building additional bulk stations and a relatively small amount through the purchase of established firms. Standard Oil men had not completed their network of bulk stations by 1899, either because the volume of sales in particular areas would not warrant the investment or because a variety of considerations dictated the continuation of distribution through particular independent jobbers.[53] Though door-to-door selling from tank wagons was extensively practiced in large cities, few such peddlers were Standard Oil employees.

Bulk stations differed according to the size of the markets which they

served. At one extreme was the small country substation, which cost no more than $2,000. Its agent supplied stores within a radius of about twelve to eighteen miles from two tanks, one for kerosene and the other for gasoline, each with a capacity of perhaps no more than four hundred barrels. He might hire a truckman on commission to deliver barrels or cans, or he might have one tank wagon which, if it served a more extensive, sparsely settled area, would stay out overnight to justify its expense. In a large city a station situated on expensive land and having several tanks, a big stock of auxiliary products stored in a warehouse meeting strict local fire ordinances, and a stable with horses, tank wagons, and drays for the "smokestack" trade, ran in cost to $100,000 or more. Jersey Standard's stations at Newark and Washington, D.C., were of this type. Some bulk stations included cooperage plants and large boiler-houses, which supplied steam not only for pumps and warmth but also for reconditioning barrels.[54]

Standard Oil marketers made deliveries from stations in several ways—in barrels of wood or iron, ten-gallon "milk" cans, and tank wagons. Wooden barrels continued to be used in less settled communities, but, where iron barrels could be returned readily, they gradually replaced the leaky and fragile wooden containers. Some marketers made deliveries in drays or wagons carrying twenty-five to thirty-five ten-gallon cans.

Tank wagons were preferred in cities and towns with concentrated population, where there were many customers within the radius of a horse's daily traveling capacity. The boiler-like tanks mounted on wagons differed greatly in size and type, having from one to three compartments. The last-mentioned type could supply two grades of kerosene and one of gasoline. In 1892 Jersey Standard's Baltimore station boasted four tank wagons, three for kerosene and one for gasoline, and enough horses to provide relays for wagons traveling long hauls of twenty-five miles. While tank wagons serving small towns had a capacity of 300 to 550 gallons, those serving cities were often much larger. For a tank-wagon driver to be promoted from a one- or two-horse vehicle to a three-horse wagon carrying about nine hundred gallons[55] probably gave the same sense of gratification and progress as for an executive to gain a corner office with three windows.

Both Standard Oil marketing companies and retailers found advantages in the tank-wagon method of distribution. Where the volume of trade was large enough to justify its use, the cost of marketing per gallon was less than by other means; the savings could be retained by Standard Oil or

passed on to the retailer in the hope of attaining larger sales. The retailer, be he grocer, general storekeeper, or hardware dealer, could be sure of the regular arrival of supplies in the quantity desired. He need not handle bulky barrels, be concerned about disposing of them, or suffer the normal 5 to 8 per cent leakage and possible damage to the flour and sugar near by. Kerosene in barrels was sold by weight, while the retailer sold by the gallon. With bulk deliveries from a five-gallon measure, tested by the government, made right into his own tank which was supplied at cost by Standard Oil, the retailer was saved considerable inconvenience and was also safeguarded from minor losses.

For those reasons, year after year marketers extended the distribution of Standard Oil products to retailers by tank wagons. Deliveries of illuminating oil by this means surpassed those in barrels and cans for the first time in 1897. The ubiquitous tank-wagon drivers delivered 33 per cent of Standard Oil's total domestic sales of kerosene in 1892 and 59 per cent seven years later. Noteworthy, however, is the fact that even in 1899 more than 40 per cent of kerosene sales were in the same type of packages used in the 1860's.[56] The millstones of change ground slowly indeed.

In carrying out their selling programs Standard Oil marketers experienced sharp rivalry, especially in the Middle West and East. Competition in selling kerosene was more intense in the cities where electricity and gas had cut into the market and where Standard Oil's biggest rivals also wanted to have a large volume of sales in order to reduce the per unit overhead costs. All major competitors adopted bulk distribution. In the spring of 1896 Pure Oil moved into New York and other Eastern cities with tank wagons. With regional pride and no apparent intention of being humorous, a friendly newspaper, the *Pittsburgh Leader,* announced the purpose of the Pure Oil Company and its seventeen associated refineries: "Their object is to manufacture a high test illuminant from pure Pennsylvania and West Virginia oil, free from adulteration of all inferior grades of the crude product. This company is composed purely of the independent elements of the trade and has almost unlimited capital behind it."[57] The vigorous Cleveland firm of Scofield, Shurmer & Teagle extended its modern marketing organization in the Middle West.

During these years price wars occurred in New York, Philadelphia, Jersey City, Newark, Des Moines, Indianapolis, and other cities. Local managers used what methods they could to get or keep "their share" of the market, and imaginative newspaper reporters wrote with gusto and color of the fight. To claim that one side always constituted the "irrita-

tion" and the other the "retaliation" would give a false picture of the normal competitive conditions at the time.[58]

Some balanced statements about the nature of competition in the oil industry were made before the Industrial Commission in 1899. One of the most fair-minded critics of Standard Oil, T. B. Westgate, characterized the nature of the rivalry thus: "Sometimes the competition is very agreeable and runs along smoothly, and then all of a sudden there will be an outbreak, not in all localities, but in some particular locality." In amplification of that statement Westgate made it clear that by "agreeable" he meant that, in nine cases out of ten, Standard Oil salesmen did not attempt to sell below his prices as long as he remained content with about 10 per cent of the trade in a town. It was "different," he said, if he attempted to get one-third or one-half of the trade, as he had in Auburn, New York, at one time.[59]

On the subject of price cutting, testimony was conflicting but relatively realistic. While Standard Oil men denied that they discriminated between different buyers, except where long contracts were running or in a few cases where, in return for tying contracts, a small concession was given, they did not deny cutting price. Neither did their competitors. On the other hand, although all marketers were willing to boast that they reduced prices to consumers, neither Standard Oil officials nor their rivals were willing to take credit for initiating price cuts. "I have no manner of doubt that, when we are closely pressed with competition at any point, we try to hold our trade," Archbold testified. "That is a natural law of trade, to which we are, of course, subject. . . . As a rule, the history of our transactions would be that the competitor forced the fight." He freely admitted: "We are in the habit of fighting vigorously to hold our trade and advance it," but he would concede that only in a few cases perhaps Standard Oil cut prices first through "the zeal and anxiety to serve of some overzealous servant." Standard Oil's perennial critic, Lewis Emery, Jr., when asked if he ever cut prices first, grudgingly admitted: "Oh, yes, I suppose so. It is trade."[60]

To counter the competition and expand sales, Standard Oil companies materially increased expenditures for advertising in the nineties. Though advertising took many forms, the type given much attention was the exhibit at fairs. Farmers attending the county and state fairs saw demonstrations by the local salesmen. More spectacular was the exhibit at the World's Fair at Chicago in 1893. In addition to demonstrations of the many uses of petroleum, including the new lemonade straw dipped in

paraffin, there was an educational exhibit. A huge map of the country, prepared at a cost of $5,000 by an expert in the United States Geological Survey, showed the oil-bearing districts, storage tanks, and refineries of the combination. A miniature operating refinery stood within an area surrounded, as one reporter described it, by a "white and gold colonnade in Italian Renaissance style, in which Ionic columns alternate with tall lamps and vases of handsome oils."[61]

Standard Oil marketers resorted to advertising even more extensively in their efforts to solve the problem of the surplus gasoline which flowed from refineries, especially those processing sour crude, after 1891. Demand from such usual buyers of the top fractions as varnish makers, dealers in paint, municipalities lighting parks with gasoline lamps, and homes and hotels using gas-making machines was not great enough to match the increasing supply. Even the rising consumption of gasoline in internal-combustion motors, whether stationary or in automobiles and the fashionable "naphtha launches,"[62] failed to take up the slack. By 1897, Jersey Standard alone had more than 142,000 barrels of gasoline stored at Bayonne waiting for market. Standard Oil executives decided to eliminate the surplus by an elaborate campaign of selling gasoline stoves to American housewives.

To carry out the decision, Standard Oil marketers took several steps in the early and middle nineties. In 1893 C. M. Higgins, who had been instrumental in expanding gasoline sales in the Middle West and South, was made assistant manager under William P. Howe of New York Standard's Naphtha Department; the cost of this department was defrayed partly by Jersey Standard and other companies in the organization. Demonstrations persuaded Eastern insurance companies to follow the example of Western firms in not charging higher rates on buildings where vapor stoves were used; for some years prior to 1892 stoves burning gasoline had been extensively utilized in the West and Southwest during the hot summer months. Stove manufacturers were encouraged to make improved stoves, and refiners were told to produce suitable gasoline. Salesmen acquainted customers with the virtues of the gasoline stoves and instructed consumers in the careful use of the devices.

Since the undeveloped Eastern market offered a special challenge, in 1897 the capable T. J. Williams was transferred from Baltimore to New York and placed in charge of a special Gasoline Stove Department which marketed the "Insurance" stove. Under the direction of Williams and others in different parts of the Standard Oil marketing empire, some

fifteen hundred special agents and salesmen, including "experts," went out to conduct an educational campaign; they demonstrated the use of gasoline stoves to consumers and distributed explanatory pamphlets.[63]

Standard Oil marketers carried on an advertising campaign in twenty thousand newspapers and seven thousand trolley cars as well as by thirty million circulars. They emphasized two brands particularly—"Red Crown Stove Gasoline" and "Pratt's Deodorized Stove Gasolene." Advertisements extolled the coolness, convenience, and economy of the new fuel which cost "less *than one-half* cent per hour," and offered assurance that it was "guaranteed not to smoke, smell or gum the burner." Pictures displayed cool, poised maids or equally unruffled housewives removing the dinner from ornate and smokeless stoves.[64]

The expenditure of $250,000 on the campaign was justified by the results. Representatives of manufacturers urged stores to have sufficient numbers of vapor stoves on hand to meet the increasing demand created by Standard Oil for them. The sales of gasoline in five-gallon cans and from barrels in stores were greatly expanded. By the summer of 1899, with other uses increasing, gasoline was in short supply and the refineries were storing kerosene in order to run enough crude to get the needed light fractions.[65] Even though in the next decade the motors of automobiles were to create an unprecedented demand for gasoline, and the vapor stoves were in general supplanted by the use of those burning kerosene and gas, this intensive campaign to sell the surplus gasoline was an important episode in the successful marketing story of Standard Oil.

In advocating the increased use of another petroleum product—heavy liquid fuel for industrial purposes—Standard Oil marketers catered to a relatively well-informed audience. During the nineties technical journals and popular periodicals were full of articles reporting and speculating on the advantages and disadvantages of using heavy oil for a wide range of purposes. The utilization of oil for fuel in Midwestern manufacturing operations since the mid-eighties was fully publicized. Railroads in the Eastern part of the United States could study the experiences of lines using oil as fuel in Russia, Peru, and California, not to mention the Great Eastern in England and street railways in the Middle West. Several roads east of the Rockies tested petroleum as fuel, but they offered no large current market for heavy oil, chiefly because they saw no adequate supply at a price low enough to compete with that of coal. The possibilities of running marine engines with liquid fuel were also attracting notice; for several years it had been so utilized in Russia and California. Easterners

observed the attempt of the *James Brand* to cross the Atlantic with steam raised by oil fires in 1893 and the successful round trip of the British tanker, *Baku Standard,* in the following year with Russian and Pennsylvania oil sharing the honors. The United States Navy, following the example of several other fleets, also experimented with the new fuel.[66]

Now supplying "reduced oil" rather than crude for fuel, Middle Western marketers of Standard Oil continued to expand their sales. Their efforts were materially assisted by the favorable publicity gained at the World's Columbian Exposition in Chicago in 1893; there visitors saw the spotlessly clean boilerhouse, which consumed more than 10,600,000 gallons of oil at a price of 1.7 cents per gallon at a reported saving of space, labor, and cost. An increasing number of manufacturers became customers of Standard Oil fuel oil salesmen, but the combination always had to share the expanding market with a number of firms, including The Indiana Pipe Line & Refining Company of the Cudahy brothers.[67]

Archbold and his associates called on their expert salesman, C. W. Owston, to increase the demand for fuel oil in the Eastern states, and he put on an aggressive campaign. Early in the 1890's Owston was transferred to New York and immediately began to build a market. He did not miss an opportunity to praise fuel oil on the basis of economy of space and labor, ease of control, uniformity in heating, "good calorific properties," speed in providing energy, safety, and cleanliness. "No ash, no sparks, no cinders." Because the "clear white fire" gave a uniform heat, Owston especially recommended it to makers of steel, glass, crockery, and brick. He dramatically staged free demonstrations for using oil fuel in brick and pottery factories. On an autumn morning in 1897, for example, a boatload of brick dealers, brick manufacturers, and Standard Oil men sailed up the Hudson to observe the performance of an oil-burning furnace which Owston had equipped at the Rose Brick Company, Roseton. The published testimonial of the president of the Brick Manufacturers Association and editorial comments on the fuel "revolution" in the brick and pottery industries of the East provided good publicity and accelerated the sale of fuel oil.[68]

Various departmental units and companies within the Standard Oil organization furthered the campaign by experimenting with uses for and methods of burning fuel oil. A tug, the *White Rose,* was built to order and from 1897, acting as a towing boat on the Delaware, it demonstrated the successful use of fuel oil in marine engines. At the same time, J. S.

Klein, superintendent of the National Transit shops in Oil City, announced that after years of experimentation he was ready to recommend his new engine for marine purposes. Meanwhile, Jersey Standard's affiliate, Gilbert & Barker Manufacturing Company, made industrial fuel-oil burners.[69]

The extent of the success of Standard Oil marketers in balancing supply of fuel oil with consumption is indicated by the state of affairs at the close of 1899. The Fuel Oil Department ceased to make contracts in advance because its product was in short supply at the moment. The *Paint, Oil & Drug Review* had truly remarked two years earlier, "Fuel oil has come to stay."[70] The United States had gone through the experimental stage, thanks largely to Standard Oil efforts east of the Rockies. All the country needed for a spectacular expansion in the adoption of petroleum as fuel was the inexpensive production, in large quantities, of a suitable type of crude oil which would be so located as to be capable of transport at low cost to big consuming centers. These conditions were soon to be met.

In spite of competition, depression, and other difficulties, Standard Oil marketers more than held their own during the 1890's. According to their statistics, their kerosene sales in domestic trade rose from 9,551,000 barrels in 1895 to over 11,000,000 in 1899, or 15 per cent. Meanwhile, the volume of their sales of naphtha and gasoline grew from about 2,639,000 barrels to 3,270,000, or 24 per cent. Standard Oil men increased their share of total sales of all petroleum products in home trade from 81.4 per cent in 1894 to 83.7 per cent four years later and maintained an average of 82.3 per cent for the five-year period 1894-1898.[71]

Taken as a whole, the record of accomplishment by Standard Oil executives and their army of helpers during the 1890's was one to stimulate their pride in the organization. Production of crude oil rose to new heights, the Standard Oil proportion of the total for the United States reaching a peak for all time in 1898. The change in the policy of purchasing crude gave the organization greater influence over price than earlier and brought it, in the estimation of Standard Oil men, into a more realistic reflection of world conditions. Refining was expanded, chiefly by increased processing of Lima-Indiana crude. When a surplus of industrial fuel and naphtha fractions appeared, marketers soon succeeded in achieving relative balance between the volume of manufactures and con-

sumption. Through innovations in refining sulphur-bearing petroleum, patent rights, and systematic efforts in all phases of operation, Standard Oil men had gained slightly on competitors and were ready to continue their program of action when the Standard Oil Company (New Jersey) became the top holding company of the combination in 1899.

PART II

WHEN JERSEY STANDARD WAS THE PARENT COMPANY

Chapter 11

Jersey Standard's Legal and Functional Organization

FROM 1899 to 1911 the Standard Oil combination, organized under the Standard Oil Company (New Jersey) as the central holding corporation, adjusted its managerial techniques and its operating policies to a rapidly developing petroleum industry and to a highly charged political atmosphere. Significant producing areas in the United States broadened from two to six: California, Mid-Continent, Gulf, and Illinois were added to Appalachian and Lima-Indiana. New types of crude oil from the Western regions created new problems for the refiners at the same time that the increasing demand for by-products—particularly lubricants, wax, industrial fuel oil, and gasoline—pressed for a modification of the entire refining pattern. Coincidental with these developments was the rising tempo of competition at home and abroad and the acceleration of growth in the size of rivals' units. While attempting to meet these conditions, throughout most of these years Standard Oil men operated under attacks in the press and courts which threatened to annihilate the organization. The financial rewards were high, but the strain was terrific.

Judged by their reactions to the multiplicity of issues facing them, the active executives of Standard Oil affairs followed a few simple general policies along the path to profits. To keep the combination intact and under their control was a primary aim of the managers. Utilizing the mechanism of the central holding company, they set about a systematization of their organization and a tightening of the relationship between the center and the periphery. The functional pattern, however, remained essentially the same as that established in the eighties. The search for new producing areas and new refining techniques was continuous. The effort was a part of the executives' attempt to retain their previous share of the market in every corner of the globe. While top strategists struggled to co-ordinate and maintain balance between the various functions in

"the general interest" of the combination, they modified their tactics from day to day according to conditions prevailing in an increasingly geographically dispersed and competitive industry. They endeavored to continue to conform to the letter of the laws in the United States and, in general, not to pursue policies abroad, which, even though economically promising, would prejudice the public and judicial attitude at home. In fact, in considering their own general interest, the executives were forced to weigh the effects of their policies not only upon stockholders but also upon independent producers and competitors, railroads, consumers, newspapers and periodicals, legislatures, and the courts. The successes and failures in carrying out these policies form the subject matter of the remainder of this volume.

JERSEY STANDARD TAKES OVER

On May 26, 1899, the directors of the Standard Oil Company (New Jersey) voted that the stockholders should be called for the purpose of altering the charter of the corporation. That decision was one of several steps toward the regrouping of all Standard Oil Interests under the legal wing of Jersey Standard. As the unifying instrument of the Standard Oil business, the holding company soon replaced majority ownership, which had superseded the Trust.

Rumors of a reorganization of Standard Oil had been intermittently circulated since 1896. On January 31 of that year, the New York *Mail and Express* printed a report that all Standard Oil properties were to be merged in a new $200,000,000 corporation, the watered stock to be put on the open market at prices as high as possible! S. C. T. Dodd said that there was no truth in the story, but, when asked if there were any plans for a reorganization on a new basis, replied with a laugh: "We never make our intentions public."[1] When a similar report began the rounds of newspapers in May, 1897, William Rockefeller assumed the responsibility for asserting its inaccuracy. Six months later, the *Star & Kansan* stated that, according to rumor on Wall Street, the Standard Oil Company was to be organized under a new name, "with four dollars of new stock for every one of the old, and a cash dividend of 12 per cent at the same time." The newspaper then asked: "How much longer will private monopoly of the means of living be tolerated by the people of this country?"[2]

Archbold and his associates had plenty of reasons for contemplating a reorganization. They desired to maintain the Standard Oil entity intact. Not only was it profitable to them; they also thought of it as one of the

greatest creations of private enterprise in the industrial history of the world. They wanted to see it live on, they wanted to direct it, and they wanted to enjoy its profits. Under the loose association of Standard Oil Interests from 1892 to 1899, control had rested in the less than twenty owners who held a majority of the stock, and in managers in whom these owners placed complete confidence. As newspapers noted, practically all the leading figures were getting old. If one of the Rockefellers or Flagler or Rogers should die, remarked the *Pittsburgh Leader*, "the heirs might not act harmoniously with the other owners."[3] With that eventuality in mind, top executives sought to perpetuate their control through the adoption of an instrument which would be simultaneously acceptable to the approximately 3,500 holders of the minority of Standard Oil Trust certificates.

At the same time it was desirable to allay public suspicion arising from the long delay in liquidating the Standard Oil Trust. On May 1, 1897, Joseph Pulitzer's *World* had stated that the Standard Oil Trust was controlled by five men—the two Rockefellers, Flagler, Rogers, and Archbold—and practically owned by ten. "Under the guise of complying with the law and 'liquidating,'" said the *New York Herald* less than two weeks later, "a few men have for more than five years been exercising absolute and arbitrary power over this vast property, and as to what they have done with it, or what it is today, one shareholder's guess is as good as another's."[4]

The attitude of the suspicious public was most graphically demonstrated by suits in the Supreme Court of Ohio against the four companies of the combination operating under charters granted by that state. In November, 1897, Frank S. Monnett, the attorney general of Ohio, filed an information in contempt against The Standard Oil Company (Ohio). He alleged that the corporation was still functioning as a part of the undissolved Trust and was therefore in contempt of the order of the court in 1892. The course of this and other proceedings against Standard Oil units is discussed in Chapter 22.[5] Here the significant fact is that the suits pointed to the pall of suspicion under which Standard Oil Interests operated, a fact emphasized by the coverage given by the press to every allegation made by Monnett and his witnesses.

On the other hand, as early as 1895 Standard Oil executives seemed to have reasonable assurance that their combination would be allowed to exist under the Sherman Antitrust Act. In his decision concerning the E. C. Knight Company, Chief Justice Fuller of the United States Supreme

Court declared that Congress had not attempted "to assert the power to deal with monopoly as such, or to limit and restrict the rights of corporations created by the states or the citizens of the states in the acquisition, control, or disposition of property; or to regulate or prescribe the price or prices at which such property or the products thereof should be sold; or to make criminal the acts of persons in the acquisition and control of property which the states of their residence or creation sanctioned or permitted." Elsewhere he stated: "Contracts, combinations, or conspiracies to control domestic enterprise in manufacture, agriculture, mining, production in all its forms, or to raise or lower prices or wages, might unquestionably tend to restrain external as well as domestic trade, but *the restraint would be an indirect result, however inevitable and whatever its extent, and such result would not necessarily determine the object of the contract, combination, or conspiracy.*"[6]

If Chief Justice Fuller's words promised the probable legality of the Standard Oil combination, New Jersey corporate laws offered a suitable instrument. The incorporation fee was only one-fiftieth of one per cent (twenty cents per thousand dollars) of the par value of the authorized capital stock, and the maximum annual franchise tax only one-tenth of one per cent of the stock issued. The state had a financial surplus and its taxes were stable. No more than one director had to be a resident of the state. There was no statutory limit on the amount of capital stock that could be issued or upon the indebtedness a company might incur. No liability by the stockholders for corporate debts was stipulated. Property and property rights were permitted to be the basis of stock issues. Publication of annual reports was not required. Probably most important of all, in 1889 the legislature had authorized the exercise of holding functions under charters already granted and in 1893 and 1896 had made the law broader and more specific by enactments.[7] New Jersey definitely afforded an agreeable legal climate for large corporate enterprises, for holding companies in particular. Jersey Standard had operated as a holding company under those laws since 1892.

New Jersey had various competitors as a legal domicile of large business corporations, but for one reason or another it proved more attractive than any other state for the purpose. In New York, charters were more expensive than in New Jersey, taxes higher, and stipulations as to responsibilities of stockholders and officers more rigorous. In the early nineties, Illinois had been popular as a charterer of corporations, but after 1896 the attorney general began prosecutions, the most publicized

being the one against the American Glucose Company, which induced many businessmen to look for a safer haven in other states. West Virginia's corporate laws were so lenient that it became, to use the words of one commentator, the "Mecca of irresponsible corporations"[8] in the late nineties. In contrast to the low estate of incorporation in West Virginia, charters in New Jersey were considered eminently respectable by many lawyers and businessmen. During the years 1899-1901 the state granted an average of 2,172 charters annually.[9] Many of the new corporations were holding companies. Not a few exceeded the Standard Oil Company (New Jersey) in authorized capital, the United States Steel Corporation—America's first billion-dollar corporation—being the outstanding example. Quite obviously, Standard Oil lawyers and executives were far from alone in looking favorably upon New Jersey's corporate laws.

Although many of these circumstances existed as early as 1896, S. C. T. Dodd persuaded Standard Oil executives to defer action. He had to have time to evaluate the implications of the decision in the E. C. Knight Company case and to estimate the possible legality of grouping all Standard Oil units under a holding company. It was his belief that "it would be impossible to do business under a combination of corporations," if the Sherman Act and the antitrust laws of various states were held to be constitutional. Dodd therefore advised Archbold and his associates to await decisions on these laws. When their validity was upheld as the years passed, Dodd believed that a "business of any magnitude" could not be carried on under a "fair construction" of the acts.[10]

Events submerged Dodd's misgivings. The need for more effective legal unification of Standard Oil companies, the popularity of holding companies and the acceptability of New Jersey laws on corporations, popular criticism and legal pressure in Ohio, all finally led to a conference by Standard Oil lawyers. Over Dodd's opposition, they advised the organization of the combination under one holding company.[11]

Provisions of the Jersey Standard charter occasioned further delay before the decision could be implemented. Top managers had been acting in the name of those who held only slightly more than a majority of the stock, but an amendment of the charter, such as raising the authorized capitalization, required an affirmative vote by holders of two-thirds of the shares. Hence, enough of the reluctant smaller holders of Trust certificates had to be persuaded to exchange their holdings for stock in the twenty companies, including Jersey Standard, for the necessary two-thirds to be attained on the stock ledger of the prospective parent.

The process of exchanging certificates for shares proceeded with what must have seemed exasperating slowness to Archbold and his associates. The first new shareholder of Jersey Standard for five years, exclusive of directors, was registered on December 24, 1897, just about a month after the institution of the contempt suit in Ohio. Not until March 16, 1899, was the two-thirds mark passed.[12] When assured that the required number of shares was legally entered in the certificate book, Jersey Standard directors issued their call on May 26 for the special meeting of the stockholders.

At that special meeting on June 14, 1899, the changes in the charter proposed by the directors were quickly approved. Ninety-one shareholders, representing 67,631 shares, were present in person or by proxy. The total authorized stock was raised from $10,000,000 to $110,000,000, divided into 1,000,000 shares of common stock and 100,000 of 6 per cent preferred, all of $100 par each. At the discretion "of the Company" common stock might be issued in exchange for preferred, which should be canceled when so transferred.[13] Other changes pertained to powers of the directors.

Table 30 STOCK HOLDINGS OF STANDARD OIL COMPANY (NEW JERSEY), DECEMBER 31, 1899

Holdings Carried Over[a]	*Percentage Owned*
Borne, Scrymser Co.[b]	100.0
Capital City Oil Co.	74.8
Central Refining Co., Ltd.	100.0
Chesebrough Manufacturing Co., Consolidated	55.5
Continental Oil Co.	100.0
Empire Refining Co., Ltd.	78.5
Empreza Industrial de Petroleo[c]	70.0
Galena Oil Co.	86.3
Gilbert & Barker Manufacturing Co.	76.5
Inland Oil Co.	98.6
New Jersey Storage Co.	100.0
Pennsylvania Lubricating Co., Inc.[d]	60.0
Signal Oil Co.	38.8
Standard Oil Co. (Iowa)	100.0
Standard Oil Co. (Kansas), The[d]	100.0
Standard Oil Co. (Missouri)[d]	65.0
Swan & Finch Co.	99.7
Underhay Oil Co.	98.8
Vacuum Oil Co.	76.5
Waters-Pierce Oil Co.	68.7
West India Oil Refining Co., The	50.0
West Virginia Oil Co.	47.5

Table 30 (Continued)

Additional Nineteen Companies	*Percentage Owned*
Anglo-American Oil Co., Ltd.	99.7
Atlantic Refining Co., The	99.7
Buckeye Pipe Line Co., The	99.7
Eureka Pipe Line Co., The	99.7
Forest Oil Co.	99.7
Indiana Pipe Line Co.	99.7
National Transit Co.	99.7
New York Transit Co.	99.7
Northern Pipe Line Co.	99.7
North Western Ohio Natural Gas Co.	59.3
Ohio Oil Co., The	99.7
Solar Refining Co., The	99.7
South Penn Oil Co.	99.7
Southern Pipe Line Co.	99.7
Standard Oil Co. (Indiana)	99.7
Standard Oil Co. (Kentucky)	99.5
Standard Oil Co. of New York	99.7
Standard Oil Co. (Ohio), The	99.9
Union Tank Line Co.	99.7

[a] Between 1892 and June, 1899, Standard Oil Co. (New Jersey) had acquired shares in six companies and disposed of those in one of these by merging its properties (Tide Water Oil Co. of Georgia, 100% owned from 1896 to 1897). It had also disposed of shares in five other companies listed as of December 1, 1892, in Table 21. It sold the stocks in United Gas Improvement Co., 1892; The Rasin Fertilizer Co., 1898; and The Liebig Manufacturing Co., 1899. The minority interests in Bush & Denslow Manufacturing Co. were bought out and the property merged in New York Standard in 1893. New Jersey Oil Co. was merged in Jersey Standard in 1895. Between the reorganization in June and December, 1899, Jersey Standard organized and acquired the shares in a new corporation, the New Jersey Storage Co., capitalized at $300,000.

[b] Acquired in 1893. [c] Organized in 1897. [d] Organized in 1896.

Source: SONJ, Consol. Accts of S. O. Interests, 1892-1899, and of SONJ, 1899, and other financial records. Dates of acquisition and disposition are derived from the accounts and do not always coincide exactly with dates of contracts.

Pursuant to the establishment of Jersey Standard as the parent, the exchange of shares began at once. The old common stock of the Jersey Company was immediately converted into the 100,000 shares of preferred stock mentioned in the amended charter. This was then exchanged, along with shares of the other nineteen companies, for new Jersey Standard shares.

All exchanges were on a pro rata basis. For ease in transfer and of liquidation of the Trust, the plan was to make each $100 share of Jersey Standard common stock have the same value, in terms of shares of the twenty companies, as a $100 Trust certificate had as of April 1, 1892. Under that arrangement Jersey Standard's immediately issued stock would have a face value of $97,250,000.

In spite of speedy transfers in 1899, George Rice prevented an early consummation of the plan. By the end of the year a total of 969,698

shares had been issued. Another 2,788 went out during the next year and 6 more by the end of 1904, making a total of 972,492. The remaining 8 shares of the Trust were in the name of Rice, or his attorney, and were not presented, purchased, and canceled until November, 1911, when the Jersey Company itself was in process of dismemberment. By that time the doughty opponent of Standard Oil had been dead six years. The eight certificates constituted almost the whole of his estate![14]

Holdings of the Standard Oil Company (New Jersey) on December 31, 1899, as a result of the transfers, are shown in Table 30. Besides its own property as an operating unit, Jersey Standard owned stock in twenty-two relatively small companies and nineteen large ones. Many of the affiliates owned stock in other corporations, the total being about seventy, some of which had subsidiaries of their own.

As an operating company, Jersey Standard contributed a substantial share to the total of Standard Oil assets. Its plant included the two refineries at Bayonne and Baltimore, the Eagle and Camden lubricating oil works, and marketing facilities from New York Harbor to Key West, Florida.

By making the Jersey Company the legal parent of forty-one companies, top managers of Standard Oil destinies assigned to that corporation the headship of a veritable oil empire. As Table 30 indicates, the Standard Oil combination was a vast and complex mechanism for locating, producing, storing, transporting, refining, and marketing petroleum and its derivatives. Accounts examined do not include statistical data on values at the time Jersey Standard assumed legal dominance, but the consolidated accounts of the entire combination at the end of 1899 showed assets valued at $294,800,234, net value being calculated at $196,694,142. Assets included the following: leases, producing wells and accompanying equipment in New York, Pennsylvania, West Virginia, Kentucky, Tennessee, Ohio, Indiana, Illinois, Kansas, and Texas; an intricate network of 10,749 miles of gathering and 3,905 of trunk pipelines in the same areas; refineries, grease plants, lubricating oil works located in New York, New Jersey, Pennsylvania, West Virginia, Ohio, Indiana, Kansas, Texas, Colorado, Canada, Mexico, Cuba, and Puerto Rico; lubricating-oil compounding plants in the United States and several foreign countries; storage tanks wherever oil was produced, refined, or sold; and transporting and marketing facilities all over the globe, including barges, lighters and tugs, sailing ships and steam tankers, warehouses, horses and mules, tank wagons and tank cars, iron drums, and wooden and steel barrels. To operate the

remarkable organization created by Rockefeller and his associates required 35,000 employees at home and abroad.[15]

NEW PERSONALITIES IN TOP MANAGEMENT

Responsibility for guidance of the vast aggregate of enterprises centering in Standard Oil Company (New Jersey) after June, 1899, resided in its often changing board of directors—the Big Board. Increased over the years from nine to sixteen members, it had lost eight individuals by 1911—one by retirement, two by resignation, and five by death. Seven men were members throughout these years, three of them being among the fifteen who appeared on the Jersey Standard Board for the first time during the period 1899-1911.[16]

In 1899, directors of Jersey Standard were drawn from the group of men who had been administering the affairs of the Standard Oil family since the 1870's. Under the authority of the amended charter, on June 19, 1899, the directors increased their membership from nine to thirteen. Two of the previous directors resigned—C. C. Burke and J. H. Alexander —leaving seven. Six new ones were then elected. Members of the Board and officers of the company for 1899 and later years are listed in Table 31.

Members of the Board fell roughly into three categories—large investors who did not play any other significant role, sizable owners who continued active in management in varying degrees, and men who, while they had but few shares, were on the Board because of their long years of service, specialized knowledge, and particular abilities. O. H. Payne attended only one directors' meeting over these years and did not have an address at 26 Broadway. C. W. Harkness represented his family's investment but never took part in the business. John D. Rockefeller had ceased coming to his office regularly some years earlier and attended only a few meetings of the Board of Directors. He sent memoranda to 26 Broadway when ideas on the petroleum business crossed his mind and was consulted by Archbold and others on occasion.[17] William Rockefeller was more active, but increasingly served in an advisory capacity after 1901. Flagler's interests outside Standard Oil were so extensive that, although he attended meetings when in New York, he barely qualified as a working director. In spite of similar diversification of interests, Rogers, a vice-president, was regularly attendant upon Standard Oil affairs, concentrating chiefly on pipelines and gas interests. Upon Rogers, plus Archbold, C. M. Pratt, W. H. Tilford, Babcock, McGregor, Bushnell,

Table 31 DIRECTORS AND OFFICERS OF STANDARD OIL COMPANY (NEW JERSEY), 1899 to 1911

Directors, 1899		*Directors Elected, 1900 to 1911*	
John D. Archbold[a]	1899 to 1911	James A. Moffett	1901 to 1911
Henry M. Flagler[a,b]	1899 to 1911	Edward Thomas Bedford	1903 to 1911
Charles W. Harkness	1899 to 1911	Walter Jennings	1903 to 1911
Oliver H. Payne	1899 to 1911	John D. Rockefeller, Jr.	1904 to 1910
Charles M. Pratt	1899 to 1911	Alfred Cotton Bedford	1907 to 1911
John D. Rockefeller[a]	1899 to 1911	Henry C. Folger, Jr.	1908 to 1911
William Rockefeller[a]	1899 to 1911	Henry M. Tilford	1909 to 1911[d]
Ambrose M. McGregor	1899 to 1900	Walter C. Teagle	1909 to 1911
Thomas C. Bushnell[c]	1899 to 1902	Orville T. Waring	1911 to 1911
Paul Babcock, Jr.[a,c]	1899 to 1902	Lauren J. Drake	1911 to 1911
Frank Q. Barstow	1899 to 1909		
Henry H. Rogers[a]	1899 to 1909		
Wesley H. Tilford[a]	1899 to 1909		

	Officers, 1899		*Changes, 1900 to 1911*	
President	John D. Rockefeller	1899 to 1911		
Vice-President	John D. Archbold	1899 to 1911	Wesley H. Tilford	1908 to 1909
	William Rockefeller	1899 to 1911	James A. Moffett	1909 to 1911
	Henry M. Flagler	1899 to 1908	John D. Rockefeller, Jr.	1909 to 1910
	Henry H. Rogers	1899 to 1909	Charles M. Pratt	1910 to 1911
Secretary	Charles M. Pratt	1899 to 1908	Walter Jennings	1908 to 1911
			H. C. Folger, Jr.	1911 to 1911
Assistant Secretary	L. D. Clarke	1899 to 1900	William P. Howe	1900 to 1911
			Charles T. White	1900 to 1911
			Frank Wilson	1911 to 1911
Treasurer	W. H. Tilford	1899 to 1908	C. M. Pratt	1908 to 1910
			A. C. Bedford	1910 to 1911
Assistant Treasurer	C. M. Pratt	1899 to 1908	William P. Howe	1901 to 1911
	F. Q. Barstow	1899 to 1908	H. C. Folger, Jr.	1908 to 1911
	William G. Rockefeller[e]	1899 to 1911	Frank Wilson	1911 to 1911
Comptroller			L. D. Clarke	1900 to 1905
			A. H. Brainard	1905 to 1911
Assistant Comptroller			A. H. Brainard	1900 to 1905
			G. G. Fay	1907 to 1911
			R. P. Tinsley	1908 to 1911

[a] All these men had served from 1892 to 1899, with the exception of John D. Rockefeller, who had served from 1893 to 1899. See Table 22.
[b] Flagler had been on the Jersey Board from 1882 to 1883. See Table 3.
[c] Bushnell and Babcock had served on the Jersey Board from 1882 to 1892.
[d] Resigned, Jan. 31, 1911.
[e] Son of William Rockefeller.
Source: SONJ Minute Bk.

and Barstow, therefore, devolved the responsibility for day-to-day operations.

The Big Board needed the additional directors in 1899 to provide personnel for carrying the burden of daily decision making. Several of the working directors were past middle age and some were in poor health. In contrast to the relative youth of the Trustees of 1882, several of whom had been in their early forties and only one past the early fifties, the Jersey Standard Board of 1899 was made up of older men. Archbold, the youngest at the earlier date, was now at age fifty-one, the third youngest of the active directors, most of whom were in their sixties or late fifties. Furthermore, one or more men were always away from New York on vacations, inspection trips, or other business.

Undoubtedly readers as well as the authors would like to know the reasons for the election of each new member to the Big Board in preference to having factual biographical sketches of the men, but in the absence of more revealing data the alternative must suffice. There were obvious factors involved in some elections. Large stock ownership, rather than activity, accounted for some directorships in a period when the company had not completely moved away from owner-management. Favorable impressions upon influential people, in addition to specialized skills or known administrative ability, contributed to the promotion of several men. Of importance, too, was the particular function left inadequately represented on the Big Board by recent losses.

W. H. Tilford and C. M. Pratt were the two relatively young men on the Big Board of 1899. Both had had years of experience in managing Standard Oil affairs, but, of the two, only Pratt was newly elected to membership.

Wesley Hunt Tilford (1850-1909) came to the Jersey Standard Board as a representative of the Bostwick family's investment and as an outstanding specialist in domestic marketing. After two years at Columbia College in New York, Tilford had entered the oil business of Bostwick & Tilford, of which his elder brother, John B. Tilford, Jr., was a partner. The brothers had separated from Bostwick in 1872 but within a year had given up their own partnership to join the Standard Oil alliance. W. H. Tilford had risen rapidly, had been sent to California in 1878, and had organized the whole Western market for Standard Oil products. Fourteen years later, aged only thirty-seven, he had been elected a Trustee.[18] Tilford had continued to specialize in domestic trade, including among his many directorships and offices the presidency of Iowa Standard

and those listed in Table 23. Tilford had the foresight, organizing abilities, friendly personality, and vigor necessary for the rough game of domestic marketing, and these qualities carried him from the treasurership of Jersey Standard to the vice-presidency in 1908 before his early death.

Charles Millard Pratt (1855-1935) represented the estate of his father, an original trustee of Standard Oil, but the son was also personally an experienced marketer in the oil industry. After graduation from Amherst in 1879, he had entered the family firm of Charles Pratt & Company and later had devoted himself almost exclusively to domestic trade. His election as a liquidating trustee in the late 1890's had symbolized his rank as one of the key figures of the combination. From 1899 to 1908 he served as secretary, and later treasurer, for the enlarged corporation, and in 1910 was elected a vice-president.

McGregor, Babcock, Bushnell, and Barstow definitely belonged outside the inner circle of large stockholders and recognized leading figures, but they had records of long service and specialized abilities. Ambrose Morrison McGregor (1842-1900) had started in refining in Cleveland in the 1860's, soon joined Standard Oil, and continued to devote his life to one function. For years he had headed the Manufacturing Committee and was referred to as a man with a keen interest in fresh ideas for refining. Shortly before his death in 1900, the former independent refiner culminated decades of service with the combination by following John D. Rockefeller himself as president of Ohio Standard. As mentioned above in Chapter 3, Bushnell, an expert in sales for export, and Babcock, a refiner, were members of Jersey Standard's directorate in 1882. Only Babcock at the time of his retirement in 1902, however, could boast two score continuous years on the Board which had been primarily concerned for its first ten years with operating the refinery at Bayonne.

Frank Quarles Barstow (1845-1909) was new to the Board in 1899 but not to the counsels of Standard Oil. When his firm in Cleveland was bought by Ohio Standard in 1872, he already had had experience in the then often twin functions of refining and marketing. Barstow had been chosen vice-president of the Acme Oil Company in the late 1870's and had moved to New York soon afterward. John D. Archbold benefited by having in Barstow a close friend and counselor, a veritable man Friday with whom he could share his thinking. Undoubted evidence of Archbold's keen interest in going into foreign production in the 1890's is the fact that Barstow had gone on the exploratory trip to the Orient in 1892. Three years later he had traveled to South America and in 1898, accom-

panied by S. C. T. Dodd, had sought petroleum concessions in Romania.[19] Barstow continued to follow most carefully all information garnered on actual or possible foreign production and submitted concise memoranda with positive recommendations to guide top management in its decisions as to entering production abroad. A wide background of experience enabled him to evaluate conditions in countries where Standard Oil might carry on integrated operations. A genial disposition as well as business capacity suited him for the task of negotiating abroad. As mentioned earlier, he rose to be president of The Atlantic Refining Company in the late 1890's and later succeeded McGregor as president of Ohio Standard.

Within the first four years after the reorganization of the Big Board in 1899, death and retirement necessitated new appointments. On the deaths of McGregor and Bushnell and the retirement of Babcock, three new active directors, only one of them from a family of large stockholders, were promoted from the ranks.

James Andrew Moffett (1851-1913) was one of the several men to rise through varied experience in refining and marketing. Born in West Virginia, he had entered the employ of J. N. Camden at the age of eighteen. After fourteen years of experience as a refiner at Parkersburg, Moffett had been transferred to the New York area as superintendent of the Pratt Refinery and in 1888 had supervised installation of bulk stations in England. His efficiency in managing men and reducing costs so commended him to top management that he had been put in charge, with W. P. Cowan, of directing the construction of the Whiting plant. As a leading figure in the combination after 1889, Moffett had held several offices, including the presidency of Indiana Standard. As operating head of this company he had been largely responsible for its excellent record in both refining and marketing during the 1890's. Possessed of a hot temper which often caused him to be explosively vocal, Moffett nevertheless inspired the confidence and loyal support of subordinates by his phenomenal memory, extremely hard work, quickness in making decisions, and warm interest in the welfare of employees. After W. H. Tilford died, Moffett was elected a vice-president of Jersey Standard. During these years he was the only man to hold this office who was neither a former Trustee nor a son of a former Trustee, and, if salary be the measure of a man's contributions, in the later years of this period he outranked all others in Jersey Standard except Archbold.

The elevation of Edward Thomas Bedford (1849-1931) to the Big

Board added a specialist in lubricants and another of the men trained by Charles Pratt. Born in Brooklyn of English parents, Bedford had had his first lessons in oil as a salesman for the Pratt Refinery and as manager of R. H. Chesebrough's vaseline factory. Bedford soon had joined Boyd & Thompson as a seller of lubricating oil. By 1872 he had become a junior partner in the firm and thereafter had shared all its reorganizations, vicissitudes, and successes. It had entered the Standard Oil alliance in 1880 and twelve years later had merged with New York Standard.[20] Bedford had continued as the manager of that company's Thompson & Bedford Department. He had shared with O. T. Waring, Silas H. Paine, and C. M. Everest the honors of developing and marketing improved Standard Oil lubricants and paraffin wax throughout the world. As indicated in an earlier chapter, Bedford was an able, genial executive who concentrated on foreign trade. Though he continued as a director throughout this period, he had many outside interests and from 1906 on his chief concern was The Corn Products Refining Company.

Birth into a leading Standard Oil family, training under Charles Pratt, and marked administrative ability paved the way for Walter Jennings (1858-1933) to the Jersey Standard Board. He was the California-born son of O. B. Jennings, who later had returned to New York and had become an early investor in The Standard Oil Company (Ohio). Walter Jennings had been graduated from Yale University and Columbia University Law School before entering the Pratt Manufacturing Company as a clerk. After varied experience in Standard Oil units, he had become assistant to George F. Gregory in the Domestic Trade Department of New York Standard. By 1890 he was serving as the manager of that department's Eastern Division. Within a few years he had attained membership on the Domestic Trade Committee. For a time he served as secretary of Jersey Standard. His vice-presidency in 1907 and later presidency of the National Fuel Gas Company turned some of his attention from immediate Standard Oil affairs.

After authorizing an increase in their membership to fourteen, the directors of the Standard Oil Company (New Jersey) elected John D. Rockefeller, Jr., in 1904. Following his graduation from Brown University in 1897, the young man had devoted himself almost exclusively to his father's investments and philanthropy. In 1909 he was elected vice-president of Jersey Standard but resigned from the Board soon afterward. Young Rockefeller attended only about a third of the directors' meetings during his period of service and modestly commented, when

asked for information for the directors' files, that he had held office for only a short time and "was never active or in any way a factor, even during that period, in the councils of the company."[21]

Alfred Cotton Bedford (1862-1925) was added to the Big Board when its number was increased to fifteen in 1907. A cousin of E. T. Bedford, he also had been born in Brooklyn. After a varied education abroad and a short experience with a New York dry goods firm, he had acquired his training in the oil industry, early in the 1880's, in the office of Charles Pratt. Bedford later managed The Bergenport Chemical Company. A protégé of the Pratts and Rogers, Bedford had represented their interests in a number of enterprises outside Standard Oil; in that connection he had served as treasurer of the Long Island Railroad Company and as secretary of the Ohio River Railroad Company. He was early credited with administrative ability, sound judgment, and capacity for public speaking. As in the case of Walter Jennings, Bedford was only in his mid-forties when promoted to the Board of the Jersey Company. Above all others in that group, he perceived that conditions of business had changed and that measures should be adopted to win public confidence. Perhaps it was his awareness of public interest, as well as his early experience in public utilities, which determined his selection to take the ailing Rogers' place on several boards of Standard Oil's natural gas companies in 1907. He also served as treasurer of Jersey Standard in 1910-1911.

The election of Henry Clay Folger, Jr. (1857-1913), to the Big Board in 1908 brought its membership to sixteen and contributed another executive developed under the wing of the Pratt family. Folger had been C. M. Pratt's roommate at Amherst College. After graduating in 1879 and while working as a clerk in the Pratt firm, Folger had taken a law course at Columbia University, receiving his LL.B. in 1881. He had shown his versatility and delight in exact presentation of facts by developing cost-and-yield statistics of all the Standard Oil refining operations for the guidance of the Manufacturing Committee. By 1886 he was secretary of that body. In that capacity and through outside study, he soon had made himself an expert on the history and techniques of the petroleum business. After some experience in the management of Pratt's East River manufacturing operations, Folger had risen to membership of the Manufacturing Committee in 1898 and later had become its chairman. He succeeded Jennings as secretary of Jersey Standard. Shy, retiring, calm, dispassionate, and scholarly (the first member of Phi Beta

Kappa to be prominent in Standard Oil affairs), Folger possessed an almost infinite capacity for detail. He became famous within Jersey Standard and New York Standard for his encouragement of aspiring, ambitious young men. Outside the company his fame rested upon his incomparable collection of Shakespeareana, now housed in the Folger Library in Washington, D.C.

To fill vacancies in the ranks of the directors four new members were elected to the Big Board during the years 1909 to 1911. When W. H. Tilford, Rogers, and Barstow all died within a few months of one another in 1909, Archbold and his associates restored the membership to fifteen by choosing two replacements. After one of these and John D. Rockefeller, Jr., had resigned, two more men were elected.

In June, 1909, Henry M. Tilford (1856-1919) took his deceased brother's place on the Jersey Standard Board. The succession was quite fitting, for the two brothers had worked closely together. H. M. Tilford had started his career in Standard Oil with the Empire Refining Company, Limited, and then had gone to Maryland to manage the marketing operations of the Baltimore United Oil Company. In 1887 he had returned to New York and had joined the Southern and Western Domestic Trade Department of New York Standard, headed by his brother Wesley. By 1893 the young man had been manager of the Western Domestic Trade Department, which had concentrated his efforts upon the business of Iowa Standard and Continental Oil. He had been elected president of the Pacific Coast Oil Company after its acquisition in 1900 and served as head officer or vice-president of the three Far Western companies in the combination until his resignation in January, 1911. At that time he had also been the chief executive of Ohio Standard for three years.

In the light of his later presidency of Jersey Standard, particular interest centers in the election of Walter Clark Teagle to the Big Board. Born in 1878, he reached top management at thirty-one, or at almost as early an age as John and William Rockefeller and Archbold had achieved the same distinction. Teagle's mother was the daughter of Maurice B. Clark, Rockefeller's first partner, and his father was John Teagle of Scofield, Shurmer & Teagle, the Cleveland refiners long famous for vigorous competition with Standard Oil. Before graduating from Cornell University in 1899, the young man had had vacation experience in his father's refinery and had prepared a paper on petroleum in a seminar in industrial chemistry. He had entered his father's firm as a marketer. When it had become a hidden associate of Standard Oil under

the name of the Republic Oil Company, the youthful Teagle had served as its vice-president and general manager. Two years later, in 1903, he had been transferred to the field of European trade. Over six feet tall, possessed of a rugged physique, tremendous energy, outstanding abilities, and great ambition, he had conducted himself very successfully in the complex European marketing situation. When William Donald, the leading Standard Oil figure in European trade, had died in 1908, Teagle had taken his place as the leader in the Export Trade group. In 1908 Barstow was planning to retire, and it was fitting that his replacement on the Board should be a man concerned with the foreign aspects of Standard Oil's business. Rockefeller had been eager to have greater representation on the Board and would have liked the members to suggest his own financial adviser, Frederick T. Gates, but the large stockholder was pleased when he learned that the Cleveland youth had been chosen.[22]

The choice of Orville T. Waring (1840-1923) in 1911 added a specialist in lubricating oil to the Board, probably reflecting the waning participation of E. T. Bedford in the daily affairs of Jersey Standard. An early refiner in Philadelphia and Pittsburgh, Waring had joined Standard Oil when the plants of Waring, King & Company in those two cities had been purchased in 1876. As chairman of the Lubricating Oil Committee during the decades after 1880, Waring had taken a leading part in improving and standardizing lubricating oils for the combination as well as in expanding their sales throughout the Western world. From 1883 onward he had also been on the committee which supervised the erection and operation of the building at 26 Broadway. By 1911 its operation was his chief occupation, though his advice on the manufacture and distribution of lubricants was highly valued.

Lauren J. Drake (1842-1918) was elected in the same year as Waring. He replaced H. M. Tilford, the specialist in domestic marketing. Born on a farm near Buffalo, Drake had had a varied experience as a grocery clerk and conductor on the Oil Creek Railroad before establishing a bulk marketing station at Keokuk, Iowa. When that business had been taken over by the Consolidated Tank Line Company, Drake had remained as an employee and by 1885 was in charge of that company's Western Sales Division at Omaha (Nebraska, Iowa, South Dakota, and northern Missouri), a post he retained when the area was allocated to Kentucky Standard in 1892. In August, 1896, he had become the manager of all Indiana Standard's domestic marketing of refined petroleum

products. Several years later he had moved to New York, where he had represented the Midwestern company and had participated in the coordinating activities of the Domestic Trade Committee. His election to the Jersey Standard Board was a belated recognition of his extensive contributions over a thirty-year period to the rapidly expanding distribution of Standard Oil's products.

The changes in the directorate of Jersey Standard continued the shift, begun in the 1890's, away from owner-management. On August 31, 1911, the stock of the company stood in the names of 6,078 individuals and institutions. All the directors, including John D. Rockefeller with 244,345 shares, held approximately one-third, or less than 332,000 of the 983,383 shares. Even the estate of Charles Pratt added only 52,802. The ten men who could be classified as active managers owned a total slightly in excess of 20,000, of which Archbold held 6,000, C. M. Pratt 5,005, Jennings 3,500, and E. T. Bedford 3,000.[23] Archbold and his active associates were not the majority owners as had been true of the active managers until the early 1890's. They carried on the tradition, however, of running the company not by a few executive officers but by working directors.

John D. Rockefeller later expressed the opinion that the directors had made a mistake for both the company and himself in having an inactive president. In 1899 Archbold and his associates continued to honor their first great leader with the nominal headship and a salary of $30,000 per year, in spite of his wish that his brother William should have the office. When indictments became numerous in 1906, Rockefeller attempted to resign, but for fear that this step would impair the confidence of the stockholders he was persuaded to retain his position. He relinquished his salary at that time and a year later more urgently desired to free himself from an anomalous position rendered increasingly embarrassing by pressing litigation. Rockefeller thought that, if his name was disassociated from the company, the corporation would not be subject to attack on account of all "the absurd and false charges respecting business affairs" with which Rockefeller himself was alleged to be associated. It was well known by that time, commented Rockefeller, that he had had no part in the conduct of Standard Oil business for years, so that the stockholders could not be harmed by his withdrawal. "I am placed in a false position," he wrote to Archbold, "and subjected to ridicule for not knowing about the affairs as one should know to be in the official relation; and I shall not be surprised to hear of stringent legislation to punish

people for occupying positions in this way." Though he felt that he should no longer be expected "to continue to endure this injustice,"[24] he followed the wishes of the directors and retained the name of president.

THE ADMINISTRATIVE MECHANISM

Rockefeller's presidency was far from the only seeming anomaly in the Standard Oil organization during the years 1899-1911. The directors of the Jersey Company modified but little the inherited administrative mechanism and procedures which had been evolving since the 1870's. Interwoven with the legal framework of the holding company and constituent corporations was the functional mechanism, which was characterized by interlocking directorates, numerous committees, and a central staff, only a part of which was transferred from the Standard Oil Company of New York to the parent company. The bases of both the formal and informal organizations were the men who acted as directors, officers, and committeemen.

In its capacity as a holding company, Standard Oil Company (New Jersey) tied together a group of diverse corporations into one petroleum business. By 1911 the Jersey Company owned shares in more than seventy companies, some of which had subsidiaries of their own. While each company had its own particular function, and careful consideration was given to the rights of minority stockholders, all the companies were managed for "the general interest" of the combination with the exception of those in which Jersey's Standard's share was small. Some units were limited to one state; others crossed several state lines. Some companies specialized in one function; others performed several, as Table 32 shows.

Some examples show the diversity. By 1911 The Carter Oil Company and the South Penn Oil Company were concentrating on the production of crude oil but were carrying on operations in several states of the Appalachian region. The Ohio Oil Company not only produced oil in Ohio, Indiana, and Illinois, but purchased petroleum and owned an interstate pipeline. Most of the large pipeline companies confined their activities to one state and to the function of piping and storing oil—Eureka to West Virginia; Southern, Crescent, National Transit, and Northern to Pennsylvania; New York Transit to New York; Buckeye to Ohio; and Indiana Pipe Line to Indiana; to name a few. Prairie Oil & Gas, a new corporation, primarily operated an interstate pipeline and purchased crude, but it also produced some oil. Integration went further with New York Standard, Ohio Standard, Indiana Standard, Atlantic Refining, and

Table 32 CHIEF FUNCTIONS PERFORMED BY STANDARD OIL COMPANY (NEW JERSEY) AND ITS AFFILIATES,[a] JUNE 30, 1911

Company	*Functions* 1	2	3	4	5	6	7	8	9
Aktien Gesellschaft Atlantic									x
American Petroleum Co.[b]								x	x
Anglo-American Oil Co., Ltd.								x	x
Atlantic Refining Co., The					x	x	x		
Bedford Petroleum Co., S. A. F.								x	
Borne, Scrymser Co.						x	x	x	
Buckeye Pipe Line Co., The				x					
California Natural Gas Co.[c]			x						
Carter Oil Co., The	x								
Chesebrough Mfg. Co., Cons.						x		x	
Clarksburg Light and Heat Co.[c]			x						
Monongahela Development Co.			x						
Colonial Oil Co.[c]								x	
Connecting Gas Co., The			x						
Continental Oil Co.							x		
Crescent Pipe Line Co., The				x					
Det Danske[b]								x	
DAPG[b]						x		x	x
East Ohio Gas Co., The			x						
Eureka Pipe Line Co., The				x					
Galena-Signal Oil Co.						x	x	x	
S. T. Baker Oil Co.							x		
Gibraltar Petroleum Co., Ltd.[c]								x	
Gilbert & Barker Mfg. Co.						x			
Hazelwood Oil Co.	x								
Hope Natural Gas Co.			x						
Imperial Oil Co., Ltd., The[b]				x	x			x	
Indiana Pipe Line Co.				x					
Interstate Cooperage Co., The[c]						x			
Marion Oil Co.	x								
National Transit Co.				x					
Cumberland Pipe Line Co., Inc.[c]				x					
New Domain Oil & Gas Co., The			x						
Prairie Oil & Gas Co., The[c]	x			x					
New York Transit Co.				x					
Northern Pipe Line Co.				x					
North Texas Gas Co.[c]			x						
Ohio Oil Co., The	x			x					
Oklahoma Pipe Line Co.[c]				x					
Pennsylvania Lubrg. Co., Inc.						x			
Peoples Natural Gas Co., The[c]			x						

Table 32—Continued

Company	*Functions* 1	2	3	4	5	6	7	8	9
Reserve Gas Co.[c]			x						
River Gas Co., The			x						
Româno-Americana[bc]		x		x	x			x	
Società Italo-Americana[b]								x	
Solar Refining Co., The					x				
Southern Pipe Line Co.				x					
South Penn Oil Co.	x								
South-West Pa. Pipe Lines				x					
Standard Oil Co. of Brazil[c]								x	
Standard Oil Co. (California)[c]	x			x	x	x	x		x
Standard Oil Co. (Indiana)					x	x	x		
Standard Oil Co. (Kansas), The					x				
Standard Oil Co. (Kentucky)							x		
Standard Oil Co. of Louisiana[c]	x			x	x		x		
Standard Oil Co. (Nebraska)[c]							x		
Standard Oil Co. of New York					x	x	x	x	x
Standard Oil Co. (New Jersey)[d]				x	x	x	x		
Standard Oil Co. (Ohio), The					x	x	x		
Swan & Finch Co.						x	x		
Tank Storage & Carriage Co., The				x					
Tuscarora Oil Co., Ltd.[c]				x					
Underhay Oil Co.							x		
Union Tank Line Co.[e]									
United Fuel Gas Co.[c]			x						
Vacuum Oil Co.[b]					x		x	x	
Washington Oil Co.	x								
Taylorstown Natural Gas Co.			x						
Waters-Pierce Oil Co.					x		x	x	
West Coast Oil Fuel Co., Ltd.[c]								x	
West India Oil Co.[c]								x	
West India Oil Refining Co., The					x			x	

Key to column headings:

1 Domestic Producing
2 Foreign Producing
3 Natural Gas
4 Pipeline and Storage
5 Refining
6 Misc. Manufacturing
7 Domestic Marketing
8 Foreign Marketing
9 Tankers

[a] See Table 48. Several companies listed there are omitted here. Raffinerie Française operated a refinery at La Pallice until 1904, after which the plant was used for storage. Iowa Standard, International Oil, and West Virginia Oil Co. were in process of liquidation by 1911. Also omitted are the companies in which Jersey Standard's interest was less than 50 per cent.

[b] These companies had affiliates in foreign countries. See Table 44.

[c] These companies were newly organized or acquired by Jersey Standard between 1899 and 1911; all other companies in this list not mentioned in Table 30 were held in 1899 by affiliates of Jersey Standard.

[d] Here are listed Jersey Standard's functions as an operating company.

[e] Union Tank Line Co. owned and operated tank cars; it had no pipeline or storage facilities.

Source: SONJ, Consol. Accts., 1911, and trial balance, Stock Investment Ledger of SONJ, June 30, 1911.

Jersey Standard, all of which not only manufactured refined oils and by-products but also carried on auxiliary manufacturing and marketing. The only corporations in the Standard Oil group that performed all four major functions in the petroleum business were Imperial, Tide Water (an ally rather than a constituent company), and three new companies—two chartered under the names of Standard Oil in California and Louisiana, respectively, and Romåno-Americana in Romania, all discussed later.

Each of the companies in the Standard Oil family was a separate legal entity. The existence of the specific corporations was in part the result of historical developments and in part the result of legal necessity. When a company was purchased, it often continued its name. Several were chartered to pursue a desired business. The directors and officers were duly elected, voted on policies, dividends, and capitalization, and carried on daily operations. The directors filled the local stipulations, if any, as to residence in a state and to stock ownership. Officers saw to it that all laws governing corporate behavior were observed by their particular unit.

Meanwhile, executives at 26 Broadway had the task of co-ordinating operations of all affiliated units into one business. To accomplish this end, Archbold and his fellows utilized the committee system and the central staff. This mechanism, which existed side by side with the board of directors of the holding company and with those of its affiliates, was informal. The techniques and procedures followed functional lines and bridged corporate barriers, though all decisions were carried out within the legal framework of Jersey Standard and its affiliates. Interlocking directorates provided the legal chain of command.

The members of the Big Board itself adopted arrangements to facilitate daily decision making and formal approval of policies by the directors. They voted to have five members constitute a quorum of the Board, which held from seven to twelve meetings each year up to 1911. Although the members of the Executive Committee were not named in the minutes of the Board, the Committee functioned actively. When subordinates referred to it, they meant those directors present in Room 1400 each day for the purpose of consultation and consensus on the strategy and tactics of management. Before being elected directors some men occasionally participated in the councils of top executives, as did E. T. Bedford, Walter Jennings, A. C. Bedford, and H. M. Tilford.[25] John D. Archbold, whose methods of leadership were patterned on those of his mentor, John D. Rockefeller, usually acted as chairman of the committee. This informal group, referred to by subordinates as the "gentlemen upstairs," or the

"men in Room 1400," was designated as the "gentlemen of the fifteenth floor" after the men had moved up a flight.

One link between the holding company and the affiliates was the Securities Committee. Like the Proxy Committee of the Trust, the Securities Committee had one member outside the directorate of Jersey Standard. In September, 1899, at a special meeting of the Big Board, Archbold, Pratt, and John Bushnell, the last-named the comptroller of many pipeline companies, were appointed a committee "to receive and hold on behalf of the Standard Oil Company, New Jersey, all stocks and securities" then owned or which might thereafter be acquired by the corporation. Walter Jennings joined the group in 1904.[26] These men bore the responsibilities for keeping the stock records in order and for voting the holdings upon the appropriate occasions.

Advisory groups continued to specialize in particular functions. Production, Manufacturing, Cooperage, Case and Can, Lubricating Oil, Domestic Trade, and Export Trade remained the names of key committees.[27] The "pipeline interests" continued to be concerned with that important phase of transportation, while some of the same individuals made up the Natural Gas Committee. Among new groups, some of which only had a temporary existence for a particular purpose, were the committees concerned with shipping and depreciation. The existence and work of the latter, discussed at greater length later, indicated one attempt to standardize procedure through the Standard Oil combination to a greater extent than before the organization of the holding company.

It is impossible to make a list of the committees and their membership for the years 1899-1911 comparable with those presented for the period 1887-1892 in Table 5. The committees were not listed in the minute books of the companies as in the earlier years. They kept no official minutes and presented their decisions in memoranda and letters, only samples of which are extant. Another action deprived the historian of a means of identifying some of the members: as long as directors chose the sales agents of various companies located at 26 Broadway, the names were put into the minutes and thereby indicated some participants in marketing committees, but that practice ceased when presidents and vice-presidents were given the appointive power in 1905. The memories of living participants have proved inadequate to the task of putting all members in their proper time and place in these informal committees. As the organization grew, the deliberations of the groups often included noncommitteemen concerned with the particular problems under dis-

cussion. The individuals known to be important in the various functions will be mentioned, as far as possible, in the analysis of the operations with which they were associated.

It is clear, however, that between 1899 and 1903 Standard Oil executives attempted to adjust their functioning mechanism as well as their advisory personnel to new circumstances and conditions of operation. Having centralized headship in the holding company, Archbold and his associates gave considerable thought to reorganization of committees and in some cases to a clarification of the responsibilities of members. Resignations and deaths of key men and the elevation of others to the Big Board necessitated new appointments to several groups. New conditions suggested modifications of existing practice in at least two instances: the rising importance of natural gas operations resulted in the revitalization of management in that field and the assignment of more specifically defined functions to the advisory group concerned; rising competition and a keener concern at 26 Broadway with the management of European affiliates led to marked alterations in both the personnel and the duties of the Export Trade Committee between 1901 and 1903. Amplification of changes in some committees is presented later in connection with analyses of Standard Oil operations.

The truly significant fact was not new but dated from the 1870's. The conference method was the hallmark of Standard Oil management. The system of discussion among groups of specialists continued. Not only did young men gain an opportunity to contribute their ideas but they were trained thereby to assume increasing responsibility in decision making. Surviving correspondence indicates that few men ever made decisions or recommendations solely on their own responsibility. New committees were called into existence to meet particular needs. Some men were on more than one committee or had periodically to appear before one or another. Their life consisted largely of trotting from conference room to conference room. The habit also prevailed in the field, where general managers consulted with superintendents and with one another. If officials at 26 Broadway wanted expert advice on a specific pricing or pipeline problem beyond that coming up through regular channels, two or more men were always dispatched to the scene of investigation instead of one. More than one point of view was always preferred.

As was true in the 1880's, a small group of men tied the legal and functional organizations together. Active directors of Jersey Standard were directors and officers of all the principal companies, each according

to his specialty. Archbold headed the producing companies—South Penn and Ohio Oil; his son, John F., stationed at 26 Broadway, was president of The Prairie Oil & Gas Company after 1906. Rogers and O'Day had first and second positions respectively in most Eastern Standard Oil pipelines and several natural gas companies until succeeded by A. C. Bedford and C. N. Payne. In fact, seven men held twenty of the twenty-seven directorships in six major pipeline companies early in the century. As members of the major or minor committees, the officers of affiliated companies who were stationed at 26 Broadway were usually fully informed of decisions which they had recommended or approved, and in their capacity as directors and officers of operating units they passed the decisions on to boards of directors and general managers for implementation. General managers of operating units often served on advisory committees. The correspondents in New York of foreign affiliates were all directors of the foreign companies to which they sent information and suggestions.

The staff at 26 Broadway, upon which all executives relied for aid, was an uncommonly heterogeneous mixture. The organization, having developed over time, continued to reflect the mélange of companies based upon historical precedent, personal predilections, state corporation requirements, and tax laws. Even such an orderly mind as that of S. C. T. Dodd did not have a complete picture of it. In addition to directors, almost all the principal manufacturing companies and many of the lesser ones had sales agents at headquarters for refined oil in domestic trade, for refined oil in export trade, for lubricating oil in the West, and for lubricating oil in the East and for export. The appointment of the same sales agent by several companies reduced expenses and permitted co-ordination of operations of several companies. Similarly, other men and units effected economies by performing a specialized function for several corporations: John Bushnell, as comptroller, supervised finances and Theodore M. Towl handled real estate and tax matters for almost all the pipeline companies; James G. Newcomb's department manufactured paint for all Standard Oil companies and did all the barrel preparing and vessel loading for Eastern refinery units; Philip Ruprecht managed foreign shipping arrangements for both Atlantic Refining and New York Standard.

When Standard Oil Company (New Jersey) took over as the holding company, none of the staff functionaries was wholly on its payroll—not one. In fact, the corporation apparently had no separate payroll for any of its operations north of Baltimore. Prior to 1899, for example, the refining operations at Bayonne, jointly with those of New York Standard

on the East River, were supervised by the latter's J. H. Alexander, while an associate in that company, W. R. King, managed all marketing of refined products in New York, New England, eastern Canada, and New Jersey. To be sure, accounts manifested a proper separation of the various activities according to legal ownership of the properties, together with appropriate allocation of costs.

Between 1899 and 1911 the Jersey Company developed a few departments to meet its own requirements as an operating unit. The Baltimore Division was already in existence. A payroll for the Constable Hook Yard became an exclusive Jersey Standard responsibility in 1900. The Refineries Department payroll, jointly met by New York Standard and Jersey Standard in 1899, was replaced by a Bayonne group and a Works group in 1902. A Jersey City Department, a financial office, appeared in 1903. A year later Harry C. Arnold's accounting department for marketing and a Treasurer's Department were added. Perhaps other staff departments solely for Jersey Standard's operations had come into being by 1911, but the extant payroll accounts permit no definite identification of them.[28]

Jersey Standard gradually assumed some of the staff departments for the combination as a whole or segments of it. Some were taken over from New York Standard; some were new creations. Expenses of some were shared with affiliated companies. In 1900 L. D. Clarke was appointed comptroller of the parent company. He held the same position with several affiliates and was entrusted with the general responsibility of supervising finances and accounting for the entire family of companies headed by the Jersey Company. The Mechanical (maintenance) Department also appeared on the parent company's payroll in that year; the outstanding subdivision was the inspection section under George M. Saybolt, who was head of a separate Research and Inspection Department by 1911. The Stove Department of T. J. Williams and the Lubricating Oil Western Sales Department of Silas H. Paine also were added to the staff of Jersey Standard in 1900. Having been appointed by almost all Standard Oil companies severally, from 1902 onward Wade Hampton supervised a group of traveling auditors and examiners who covered North America and Europe. Payment of clerks in Tilford's department, charged with general supervision of Western trade, also devolved upon the parent company in 1902, as did the salaries of the staffs of the Executive, Lubricating Oil, and Domestic Trade committees a year later. At the same time, Charles T. White's stock-transfer office was created. In 1903 the Manufacturing Department, an accounting unit for the refineries of

the New Jersey and New York companies, appeared on the Jersey Standard books. In the following year P. S. Trainor's Crude Purchasing and Carrying Department was transferred from New York Standard to the parent company; two years later Jersey Standard began paying all, not merely a part of, the salaries of personnel in the Legal Department, then headed by Mortimer F. Elliott.[29]

Other departments vital to general staff activities remained with New York Standard throughout the period. Jersey Standard and other units paid part of the expenses. The Statistical Department, begun as an adjunct of the Manufacturing Committee by Folger and developed by W. E. Bemis, had progressed far enough to compile estimates of world production and sales as well as data on all operations of the Standard Oil combination. Export trade centered in F. D. Asche's department, foreign shipping in Philip Ruprecht's, marine oil in C. E. Bedford's, and fuel oil in C. W. Owston's.

Still other service units were not located in New York at all but in Oil City, in an office building owned by National Transit. The Right of Way and the Telegraph and Telephone departments there served at least twenty-one natural gas and pipeline companies.

Probably one reason for location in Oil City was the perennial shortage of space at 26 Broadway. So limited was room in New York that when one man left on a business trip in 1899 another took over his desk. T. J. Williams wrote congratulating the unfortunate absentee on his successful trip, apologized for his loss, and assured him that on his return O. T. Waring would locate him elsewhere in the building. By 1909 offices became so crowded that numbers 44-50 Broadway were purchased.[30]

Although the staff departments were not all logically assigned to the parent company, as they are today, other reasonable considerations kept them as they were. Personal preferences, historical evolution, and inertia undoubtedly all contributed to the seemingly haphazard arrangement. It mattered little upon what payroll staff members were found. They were almost all situated at 26 Broadway, with few exceptions their salaries and expenses were shared by units utilizing their services, and they labored at tasks set by both the nominal employer and the associated units in the combination.

Furthermore, the system worked. Whether as a Jersey Standard or as a New York Standard employee, P. S. Trainor presented his daily report on crude oil production, prices, stocks on hand, and estimated needs to the Executive Committee. The Statistical Department kept up-to-date records

on all phases of operations by Standard Oil and its competitors in all parts of the globe. Its annual summary was a masterpiece of coverage and condensation, so valuable that it is regrettable that only the issue of 1906 has been preserved.[81] If other staff units performed their tasks as well as those two, executives possessed excellent data for their guidance in making decisions. The data were not so accurate as those furnished to heads of large businesses today, but sources of information were neither so plentiful nor so reliable then as they are now.

DECISION MAKING AND CONTROLS

Directors of Jersey Standard needed every bit of assistance that the staff could render in order to make the decisions and exercise the control necessitated by their wide range of functions. Although their most important duty involved considering all questions in "the general interest" and maintaining the proper co-ordination between the various functions in their domain, they spent the major part of their time on so-called routine management. They set the prices to be posted for crude oil according to the situation in the world market and in accordance with the types of crude produced and conditions prevailing in the individual fields. The directors had to approve appropriations for all types of companies and activities, settle disputes between battling managers of affiliated corporations and between those concerned with different functions, and standardize procedures for companies located and operating in every important city of the world. At the same time all proceedings had to be conducted with meticulous attention to legal considerations, for the holding company as such had no rights beyond those of a stockholder.

The entrepreneurial function was diffused throughout the organization. Though final approval of action resided in the top echelon, ideas originated all along the chain of command and were so modified in committees that the identity of the actual parent was usually forever lost.

The process of formulating policies varied with the circumstances. Although a few decisions appear to have been made by the directors with a minimum of suggestions from lower echelons, by far the majority of directorial acts resulted from specific recommendations by field men, committees, and staff. Approval was often virtually automatic, though the responsibility rested with the directors of the parent company. Data poured into 26 Broadway from the field, showing the development of a definite situation calling for action in Mid-Continent or California production or in meeting price cuts in Tennessee or Bombay. After the appro-

priate staff department had digested the data, the proper committee pondered, discussed, and recommended a course of procedure. Sometimes experts were dispatched by the directors to get supplementary evidence from the critical area. In either case, the Executive Committee discussed alternative suggestions and arrived at a decision. The system was ponderous, slow, and meticulous. Care was at a premium, haste at a discount.

An example of a specific, relatively unimportant event points up the procedure. In 1899 Paul Babcock wrote a memorandum to A. M. McGregor of the Manufacturing Committee suggesting that the leasing contract with the Empire Refining Company, Limited, should be bought up. The Executive Committee decided that Babcock should first ascertain the asking price for the land upon which the idle plant stood. McGregor wrote a formal letter advising Babcock of that decision. After the next meeting Babcock wrote on the letter: "Decided to postpone *to next June*," and then reminded himself to raise the matter for discussion on May 25 and June 1, 3, 5, and 10.[32] The land was finally purchased and the lease canceled eleven years later!

Members of the Executive Committee on occasion experienced difficulty in getting men to refer matters to them in advance. This committee continued to insist that every expenditure of $5,000 or more should bear the stamp of its approval. Although a rule was handed down in 1904 that all appropriations should be approved *in writing* in advance of spending, the natural gas men did not always conform, perhaps because top management had shown no more than mild enthusiasm for their efforts during the nineties. Daniel O'Day, as late as 1905, was forced to reprimand Elizur Strong, president of two companies, for submitting his "estimates" after the ordering of supplies had begun. "I cannot tell you how embarrassing it is for us when we say we have done such and such things," wrote O'Day. "We are asked repeatedly on what authority have we done that." Then he added: "We must know about such things before work is ordered, so that we may have proper authority to do it."[33]

Because to every general manager of a company his own particular showing was paramount, many disputes between Standard Oil corporations had to be refereed by Archbold and his associates. Among disputants the exuberant John J. Carter occupied a prominent position. After The Mountain State Gas Company had agreed to buy territory producing gas from The Carter Oil Company, C. N. Payne, representing the natural gas interest, objected to the purchase price for some leases. In Carter's bill some $9,000 of the total $30,078.18 covered the cost of drilling dry holes.

Carter's reply to the gasmen illustrated the producer's unwillingness to compromise but his acknowledgment of the authority of top management. To John Tonkin, Carter wrote:[34]

> If you feel like sending a check for same, all well and good; if you don't, and can get 26 Broadway to issue an order to me to turn the property over to you at one ($1) Dollar for the whole lot, I will do it willingly.
>
> You must do your "haggling" with New York, I am a man of peace and acts. I have no time or inclination to hunt for gas property at less than cost and give to your Company for less than it cost me to get it—unless 26 Broadway says to the contrary, when I will say with the old Gladiator: "He about to die, salutes you."

Carter was paid in full.[35]

Similar issues arose between refineries and gas companies in the combination. Beginning in 1896, The Mountain State Gas Company sold its wares to Jersey Standard's Parkersburg Refinery at 6.25 cents per barrel of crude oil run, which to the gas company's chagrin averaged only 4.82 cents per thousand cubic feet of gas consumed, compared with the 8 cents per thousand cubic feet charged to other manufacturers in the area. In 1902 the seller complained at Parkersburg's wasteful use of the fuel and asked that new burners be installed to increase efficiency. The refiners then presented a bill for the burners to the gasmen, who indignantly refused to pay.[36]

More significant than disagreements over division of costs or intercompany prices were others that arose between men who had conflicting interests because they concentrated on different functions. From the "pipeline standpoint" nothing was more important than keeping the producers stimulated to extract and deliver crude to Standard Oil pipelines; hence pipeline men tended to be interested in relatively high prices of crude petroleum and a constant market. Refiners, on the other hand, were concerned with the price of crude as consumers of raw material. They wanted an adequate supply, but they did not want it of a quantity in excess of their facilities to manufacture or of a quality not suited to yielding by established methods of refining the products which could be profitably marketed. In 1903, after C. N. Payne had asked Joseph Seep to delay the announcement of a change in the price of a certain grade of crude until further consultation, O'Day wrote that Rogers "raked" him "over the coals" and reminded him that it was the pipeline function merely to run oil, not to be concerned with price.

This declaration merely made the pipeline men more tactful in their

objections. In 1904, after the transportation men in the Mid-Continent had vainly protested to W. H. Tilford and J. A. Moffett against a new system of pricing crude with gradations for each one-half degree of gravity between 28° and 32° Baumé, C. N. Payne put himself on record in much detail against the change, even though the decision had been made. Among other things, he thought it would adversely affect friendly relations with producers. Five years later the fine distinctions in pricing, though scientifically determined by refiners, had proved unmanageable in practice. They were discontinued, and the pipeline men's position was vindicated.[37]

Top management in New York sought to maintain personal knowledge of operations and of men by making annual tours. In 1905 the members of the inspection party were J. D. and J. F. Archbold, Rogers, Moffett, and Jennings. Many other officials joined them for part of the route, which covered Pennsylvania, West Virginia, Kentucky, Tennessee, Indian Territory, Oklahoma Territory, Kansas, Nebraska, Indiana, Illinois, and New York. J. J. Carter visited California the same year and reported to Archbold.

The Executive Committee also possessed supplemental means of control. Members had full information in the statistical data which flowed into 26 Broadway. Their financial control was extensive. Archbold and his associates, or their staffs, reviewed appropriations by affiliates and approved intracombination loans. As directors and officers, they usually furnished the dominant voice in determining dividend rates and hence the proportion of earnings of a particular affiliate to be reinvested in the enterprise. Officers at 26 Broadway insisted that all general managers report on all salaries of $600 or more and on all promotions. Simultaneously, through Wade Hampton's office and its traveling auditors, the man at the helm asserted even closer supervision than in earlier years over accounting practices. In fact, a general tightening of controls by 26 Broadway occurred between 1899 and 1911, a fact demonstrated in the subsequent discussion of the relations between top management and European affiliates. Although recommendations from the field were almost always approved, the fact remained that the controls resided at the central office of the combination.

On all matters managers of Standard Oil affairs tried to observe the letter of the law meticulously. On every move they sought the advice of Dodd and M. F. Elliott, who succeeded the former in 1905 as the combination's chief solicitor. The correspondence of Dodd and that of Elliott,

which has remained intact for the years 1898 through 1911, shows how honestly and assiduously they attempted to keep Standard Oil operations everywhere within the law. Archbold and his associates wanted to do business in both domestic and foreign markets. Whenever advantage dictated it, they organized companies for specific purposes in particular areas, and legally their own officers made the decisions. It is small wonder, indeed, that both the lawyers and Jersey Standard executives went on record, whenever occasion permitted, as advocates of federal incorporation for companies operating in the national market as a whole. Under such incorporation it would not have been so imperative that the proper official of an affiliated company should initial and approve recommendations from advisory committees and from general managers in the field—HHR for pipelines and gas matters, JDA for production, JAM for several manufacturing companies, and the like.

Being human, the general solicitors were not always right and, being human also, the executives did not always take their advice. Given the facts and legal precedents, Standard Oil lawyers considered the grouping under the holding company legal; they had not absorbed Peter Finley Dunne's idea that the Supreme Court follows the election returns. On the other hand, after Elliott came to New York in 1898, he told marketing officials more than once that they should not masquerade behind wholly owned secret local units, the so-called "hidden" or "bogus" companies. He never cited legal references, however, which may account for continuance of the practice. The Big Board itself violated Elliott's precept in connection with The Manhattan Oil Company and the Republic Oil Company, two large operating corporations in the Upper Mississippi Valley. As far as can be ascertained, from 1899 to 1909 the chain of ownership of the first ran from a special account on New York Standard's books in the name of James McDonald, who in turn invested the funds in an English corporation which purchased and held shares of the Midwestern corporation. Much less public suspicion would have been aroused had Elliott's advice been followed. Competitors almost always knew or suspected the truth, and the use of hidden companies proved poor business policy both in the short run and in the long run, as testimony in numerous legal proceedings amply disclosed.

The lawyers could not provide solutions to many problems, however. In spite of majority ownership of the stock and representation on the board of directors, executives of Standard Oil Company (New Jersey)

failed to control the Waters-Pierce Company. Further elucidation appears in Chapter 15.

Specialists in functions and staff operators occasionally cut across the chain of command, and collisions were sometimes avoided only by careful selection of stationery bearing the proper letterheads. After T. J. Williams had been selected to co-ordinate the disposition of all idle property in 1899, he always had to be sure to write the letters concerning sales upon appropriate stationery for signature by an officer of the owning corporation. Although O'Day had no official connection with the Pacific Coast Oil Company, he told its president what man would manage its pipelines. Pressure from the same "interests" on price policy with regard to crude oil has been mentioned in another connection.

In all the mixture of companies and legal channels of control, John D. Archbold supplied an effective example in dealing with his peers and subordinates. He presided as impartial chairman in Room 1400, except with respect to the producing function. He was a firm believer in delegation of authority. Amiable, friendly, and inspiring, Archbold was convinced that a man did his best when given a free rein. As chief executive he did not restrict his subordinates' initiative and originality by imposing his own opinion on them. He did, however, expect weekly detailed reports from the field. The fullness and frankness, sometimes even chattiness, of many reports indicate that Archbold's men knew he was not only interested in information but also in their reasoning, judgments, and recommendations. If Archbold wished to make a suggestion or propose a policy to the general manager of South Penn or Ohio Oil, he avoided putting the ideas into cold, authoritative writing; he asked the subordinate to come to 26 Broadway for a face-to-face conference.[38]

Managers had varied techniques in human relations, however. As in earlier years, top executives often found it desirable to pair men of different personalities in a specific area of operations. Until 1906, for example, Rogers' autocratic inclinations were tempered by Daniel O'Day's democratic leanings and respect for the interests of subordinates. O'Day's relationship with his pipeline men is discussed in later chapters.

As the foregoing discussion indicates, some of the changes in Standard Oil's organization and personnel during the years 1899 to 1911 were significant, while others were relatively insignificant. The elevation of Jersey Standard to full holding-company parenthood was important to

that unit, though actually the Jersey Company merely took over the running of an integrated world-wide business where the Trust and the community of interest left off. Personnel changed considerably. The pattern of staff organization, allocation of departments, method of decision making, and techniques of control after 1899 reflected the gradual modifications in the basic organization set up in the 1880's.

Chapter 12

Jersey Standard's California Enterprise 1900–1911

IN 1900, after considerable investigation, Standard Oil embarked on an integrated petroleum business in California. Once the decision was made, Standard Oil faced a whole new set of problems in a state where the petroleum industry was both geographically and technologically separated from that farther east. The geology of California and the types of petroleum found there presented a new set of difficulties in producing, in building and operating pipelines, in refining crude, and in marketing the products. The great distance between 26 Broadway and one of Jersey Standard's few integrated affiliates afforded other problems. The story has been selected as a case study of both actual operations and the relations between the holding company and an American affiliate, not only because extant papers provide evidence in this instance, but also because California produced a greater amount of petroleum than any other state in the nation during the first decade of the century.

MOVING INTO CALIFORNIA

Several factors contributed to the decision of top management in the late nineties to carry on an integrated petroleum business in California. Well established as a marketer in the West for two decades, Standard Oil not only wished to protect that function but saw the possibilities of the oil industry in the area. Local production was growing rapidly. Though the heavy type of crude petroleum with its asphalt base gave rise to several problems, the solutions to them seemed probable. Local companies were developing a market for the heavy oil as fuel, and Standard Oil already had gained considerable experience in this field of marketing east of the Rockies. New methods of refining promised a better kerosene from Pacific Coast crude than the small proportion of inferior quality refined by the usual methods. If more satisfactory techniques of distilling and treat-

ing the top fractions of California crude oil were devised, Standard Oil could save on the heavy costs of carrying supplies from the East. It had an efficient marketing organization to sell products in the Far West, and New York Standard's agents in the Orient were in need of cheaper kerosene than that carried by the long water route from eastern ports of the United States to the Far East.

By 1900 Standard Oil already had had many years of experience in California, although it was limited to one function, marketing. In the name of Ohio Standard, W. H. Tilford and his brother, E. A. Tilford, had begun to develop the market in the West for Standard Oil products in the late 1870's. In 1885, as one of the moves of the combination to systematize its domestic marketing, a new Standard Oil Company, chartered in Iowa, had taken over sales of Standard Oil products to the Far West. Iowa Standard, of which all but the qualifying shares were held by Jersey Standard from 1892 onward, had bought its supplies largely from Standard Oil (Indiana) and New York Standard. At first the new company had sold only "Eastern oil." It had pushed especially the famous Eocene brand at its growing number of stations in California, Arizona, Nevada, western Montana, Idaho, Oregon, Washington, British Columbia, and Hawaii. Then it had also marketed the relatively small quantity of gasoline and kerosene refined by the leading local manufacturers in California—the Pacific Coast Oil Company, the Puente Oil Company, and the Union Oil Company—under contracts dating from 1885, 1898, and 1899, respectively. In order to compete in a growing trade, moreover, in 1895 Iowa Standard had announced its willingness to buy and market some local crude petroleum as industrial fuel oil. In the following spring it was offering fifty-five cents per barrel in Los Angeles and receiving small deliveries. Its available storage facilities were limited, and it commanded no great market for fuel oil, since the large consumers bought from local refiners or made contracts directly with producers.[1]

As the output of petroleum in California increased in the late nineteenth century, local oilmen developed a demand for its products. In 1876 the output was only 12,000 barrels; by 1895 the one-million-barrel mark had been passed, and California ranked as sixth state in contributing petroleum to a national total of somewhat over 52,000,000 barrels in that year. From the middle 1880's onward, marketers were successful in increasing the sales of oil for fuel in an area where coal was scarce. Oil was used for generating steam for sugar refineries and other industries and for running steamers on San Francisco Bay and the Sacramento River. In

the middle eighties railroads started to experiment with it as a substitute for coal, and by the late 1890's both the Southern Pacific and the Atchison, Topeka & Santa Fe railroads burned liquid fuel in many of their locomotives. Other products, including gasoline for stoves, also helped to compensate for the smaller yield of kerosene; marketers sold residuum for greasing skids in the lumber districts and asphaltum for street paving. By 1896 the latter product was being shipped east.[2]

In the kerosene age of the petroleum industry, however, developments which promised a larger yield of satisfactory illuminating oil were more important than by-products in attracting Standard Oil men. Three local companies were successful in making a better kerosene. The Union Oil Company of California employed at its refinery a Swiss-trained scientist, Dr. Frederick Salathe, at the "fabulous salary" of $10,000, and later S. F. Peckham with his wealth of experience in the United States and laboratory work in the University of Berlin. The Puente Oil Company, a small integrated corporation, opened a new refinery in Chino, California, in 1896. It and the Pacific Coast Oil Company had the advantage of possessing wells producing petroleum which was lighter in specific gravity and yielded a higher percentage of kerosene than most California crude.[3] It was the kerosene of these companies which Iowa Standard undertook to buy in 1885 and later.

The possibility of California as a source of supply for the Far Eastern trade, as well as for the Far Western consumers, was a significant consideration to managers of Jersey Standard. In the 1880's and 1890's the state was an importer of petroleum; it received small shipments of heavy oil from Peru, and kerosene from eastern United States to mix with the local product to upgrade it. But California's own growing production and improvements in refining offered good prospects for increasing its supplies for both the local market and its small current exports to western Canada, Alaska, Japan, Asiatic Russia, and the Pacific Islands.[4] In 1897, it will be recalled, Standard Oil had not been able to obtain a foothold in the Dutch East Indies as a source of supply for Far Eastern markets. Here in California were petroleum fields connected with the large Oriental market by inexpensive water transportation to attract Standard Oil's refiners and foreign marketers.

A long period of careful preliminary investigation preceded the establishment of an integrated petroleum business in California. Early information came primarily from two sources: the letters of the marketers of the Standard Oil Company (Iowa) and the special reports of experts

representing the refining and producing interests of Standard Oil. H. M. Tilford, the vice-president of Iowa Standard, kept Archbold informed about California by forwarding letters from salesmen and clippings from newspapers and other printed material. From time to time Standard Oil officials sent out experienced men to study the western petroleum industry. An investigation was made in 1892. Four years later H. C. Folger, Jr., visited Los Angeles and, after analysis of many samples of California petroleum, gave a discouraging report concerning its yield and the quality of the kerosene. Within a few months William Fleming, general manager of The Ohio Oil Company, wrote of Los Angeles and its oilmen, "Each spot is very small of itself yet they appear to produce a great deal of oil in this town."[5] He added an interesting account of the boring for oil in the ocean at Summerland, Santa Barbara County, and the use of fuel oil to provide power for drilling.

In 1899 two of Standard Oil's leading experts in production made another detailed investigation, wrote a comprehensive report on the California field, and recommended immediate action. C. F. Lufkin, recently returned from Sumatra, and John F. Eckbert of The Carter Oil Company advised participation in the western field. Not sure at that time of the refiners' decision as to the suitability of California oils for the kerosene trade, they did "venture" to recommend entry into the fuel oil business of the West.

Lufkin and Eckbert, however, warned Archbold of the many new problems which Standard Oil would have to face and recommended finding local allies, a policy adopted in foreign countries. The major difficulty of the western industry had been "establishing a market." Moreover, the Californians seemed "determined" that no oil could be found anywhere except in the most precipitous canyons where production was "exceedingly tedious and expensive." Lufkin and Eckbert believed that it would take a long time to get an affiliate "systematically established." They wrote: "It will practically have to be a new creation throughout, without the associative influences and combined experience of *all* the men who have ever had anything to do with the business from its inception to the present time, which have had so much to do in promoting progress and method at home."[6] The experts strongly recommended that should Standard Oil decide to go into producing in California, it should purchase "something already under way." In 1899 they advocated that this should be the Union Oil Company or the Puente Oil Company. They reported, also, that several companies had given

them every facility to examine properties and seemed both ready and eager to negotiate.

Standard Oil made several unsuccessful attempts to buy into the Union Oil Company. In 1896 H. C. Breeden, assistant manager for Standard Oil Company (Iowa) in San Francisco, offered to purchase 51 per cent of the stock of the Union Oil Company of California. Lyman Stewart, founder and president of that company, refused to consider the offer, and managers of Standard Oil did not wish to accept his counterproposal that they buy the whole company. Standard Oil made two later offers: first, to buy the properties, and then in 1898 to purchase all the stock. By that date the roles were reversed: Lyman Stewart was not willing to sell out in full. The next year Standard Oil representatives heard indirectly that the managers of Union Oil Company felt "a slight soreness over the abrupt manner" in which they thought negotiations had been dropped. In spite of additional discussions between Standard Oil and the Union Oil Company, the latter was not purchased. In 1899 the president's son, William L. Stewart, an aggressive marketer, became general manager of the company and, eager to develop the industrial fuel market, agreed to sell his company's refined products through Standard Oil, an arrangement which lasted until 1906. The company retained its separate and successful existence, however. During the decade under review, Union Oil made several contributions to the petroleum industry, one of which was opening the Trans-Isthmian Pipe Line (Panama) through which oil was traveling by November, 1907.[7]

In 1900, Standard Oil Company (New Jersey) purchased the Pacific Coast Oil Company. Organized in 1879, this corporation boasted of being, through its affiliate, the oldest company in continuous operation since the western petroleum industry got its real start in the 1870's. At the time of purchase it had a record of producing oil for about eighteen years and had completed one hundred wells, about a third of which were still productive. In addition, the company owned the Newhall gas line, which provided gas to operate some of its plants, a short pipeline running from the Newhall field to the coast at Ventura, a tanker (the *George Loomis*) to carry oil from there to the company's refinery at Alameda Point near San Francisco, tank cars, stock in a pioneer producing corporation, the California Star Oil Works Company, and a broad charter. Other assets of the company were its chemist, Eric A. Starke, who held in his name a new patent for refining California oil, and Demetrius G. Scofield, an able executive whose experience in producing in the state dated back

to 1875. Managers of the Standard Oil Company (Iowa) had marketed the concern's output of gasoline and kerosene for a number of years and were acquainted with the organization, its men, and its output. C. N. Payne and T. M. Towl, who evaluated the property and strongly recommended its purchase, reported that although the refinery was old, much of the other equipment of the corporation was "first class and up to date" and "could not be improved on by eastern men or machinery."[8] The price paid for all the stock, based on the appraisal, was approximately $761,000.

The Standard Oil combination could assure its promising new affiliate a wide range of valuable assistance. Plentiful funds would be available for experimentation and expansion of plant facilities. Standard Oil could provide a reservoir of men with administrative and specialized abilities on which Pacific Coast Oil Company could call to supplement its current staff. Both domestic and foreign marketing organizations were available to sell the products of the California corporation.

From 1900 to 1911 Jersey Standard was concerned with all phases of the petroleum industry in California. Two of its affiliated companies operated in this area until one of them took over all the functions. At first, the Standard Oil Company (Iowa) continued to be the marketer in the Far Western states, while the Pacific Coast Oil Company carried on producing, buying of crude, storing, piping, and refining. The capital of the latter was raised from the $1,000,000 of 1900 to $6,000,000 three years later. In 1906 its name was changed to Standard Oil Company (California), its authorized capital was increased to $25,000,000, and it took over the property and business of Iowa Standard. Jersey Standard owned all but the qualifying shares of Standard Oil Company (California) and financed its rapid expansion by loans as well as by purchase of stock until the divestment of 1911 started the western company on a separate career.[9]

Throughout the period the former leaders of the Pacific Coast Oil Company and executives of Iowa Standard managed and operated the business in California, with the help of Standard Oil experts and advice and suggestions from 26 Broadway. W. H. Tilford was president of Iowa Standard until 1907, and H. M. Tilford was president of Pacific Coast Oil and later of California Standard. W. S. Miller continued to be treasurer and manager of the Iowa Company until 1906, with H. C. Breeden assisting him. D. G. Scofield, manager of the Pacific Coast Oil Company before 1900, became vice-president and a director of the corporation after that

date, and later of California Standard. The local executive committee, appointed in 1903, was made up of Scofield, Miller, and Breeden. W. S. Rheem, experienced in eastern refining, superintended that function, and after 1906 was also secretary of California Standard. E. A. Starke continued to be the valued chemist, although he was not so well paid as the scientist of the Union Oil Company.[10]

After the executives had studied the situation for a few months, they set their course for expansion. Coalinga petroleum offered the best source of available raw material; it contained a higher percentage of volatile products than other California crudes in plentiful supply at the time. San Francisco Bay offered advantages as a refining center, both because of its own neighboring population and its connection by railroad and water with other areas. Standard Oil men embarked on a number of paths simultaneously. They began building a large, completely new refinery at Point Richmond on San Francisco Bay, stepped up the research and experimental program in order to improve the quality of the products, and began building storage facilities for oil and a pipeline from Bakersfield and Coalinga to Point Richmond.

PROVIDING PIPELINES AND STORAGE

Standard Oil pipeline men were accustomed to overcoming difficulties in their work, but California conditions presented them with an unusual number of obstacles. The men managing the new undertaking on the Pacific Coast were working three thousand miles from their home office and almost as far from major manufacturing plants catering to pipeline and tank construction. The producing fields in this large state were many and scattered and the oils from them differed markedly in quality. The task of transporting thick, viscous oil on a large scale proved especially trying. At the same time, the pipeliners were spurred to rapid construction by the knowledge that as soon as their company entered the various fields it could anticipate lively competition in buying crude oil and in providing services to the producers. In many areas other large buyers, including railroad companies, preceded representatives of Standard Oil.

The Standard Oil trunk pipeline from Bakersfield and Coalinga to Point Richmond was the first long line built in California. Rather than construct a short line across the mountains and continue to transship crude oil by tanker to San Francisco Bay, officials decided to lay the longer line down the San Joaquin Valley in order to carry Kern River and Coalinga oils directly to Point Richmond. The problems of construction

and early operation of this line, "one of the most important pioneering adventures in pipe line transportation," are revealed in the extant letters of Daniel O'Day and frequent reports from California to him for the years 1901 to 1905.[11]

Although the Pacific Coast Oil Company was legally an integrated California corporation, the pipeline interests of Standard Oil worked in an operational organization which cut across company lines. The men in the different departments in the West worked out daily problems together, but they reported fully to 26 Broadway. The field men kept in close touch with O'Day, who in turn had conferences with C. N. Payne and others before referring matters of policy, chiefly appropriations, to Room 1400 with definite recommendations "from a pipe line standpoint." There different functions were brought into balance and considered in relation to "the general interest." The local managers of pipeline construction and operations were given a large measure of independence in carrying out general orders, not only because they worked for a separate legal entity, but because they were trusted employees, knew local conditions, the responsibility for success rested on them, and their best work was needed.[12] Some evidence indicates that pipeline men at 26 Broadway delegated authority to the western companies more successfully than the leaders of any other function.

To manage the Pipe Line Department of the Pacific Coast Oil Company, several experienced men and their aides went from the East. W. V. Miller, a highly valued assistant of C. N. Payne, arrived in California as field superintendent in 1901 and suggested meeting the immediate problem of storing the rapid flow of heavy oil at Bakersfield by building earthen reservoirs. Early in the next year Forrest M. Towl took charge of construction of pipelines. In 1903, when Towl returned to the East to be superintendent of trunk lines there, John Page, a college graduate with practical experience with the Buckeye Pipe Line in Ohio, was appointed general manager of the department.

Within a few weeks after reaching San Francisco Forrest Towl reported rapid progress. He established an office in Oakland, since many purchases were to be made in California. The construction men obtained rights of way, bought poles for many miles of telegraph wire, and contracted with Western Union to string wire at cost along the pipeline. Towl obtained sites for ten pumping stations and signed contracts to have water wells drilled to serve them. He made an agreement to purchase from the Risdon Iron Company of San Francisco five 55,000-barrel tanks

for Point Richmond, together with boilers and condensers for the pumping stations.

Although there were delays, the initial building of the pipelines proceeded relatively rapidly. By April, 1902, forty miles of separate pipes had been strung, but no tools had arrived to join them. Towl borrowed a few tongs for screwing pipe lengths together until the needed supplies traveled the many miles from the East. This delay and other difficulties were irritating, particularly the intense heat and the scarcity of water and experienced labor. Within a year, however, Standard Oil men had added over three hundred miles to their pipeline empire. The line ran 280 miles from Bakersfield to Point Richmond, with a branch from Coalinga joining it at Mendota, as shown in the map on page 351.

After completing the line, in March, 1903, the pipeline engineers faced another trying problem. How could the heavy oil found in Kern River field and part of Coalinga be pumped to the coast? For some weeks observers predicted a failure. First, the men were delayed in the routine testing of the line by lack of water to run through the pipe. Then the heavy oil moved too slowly. Several suggestions were made. Daniel O'Day wrote to the general manager of the Buffalo General Electric Company, an old pipeline man, asking whether an electric wire through a pipeline could be used to warm the oil and make it more fluid. The latter thought that the technique would cost too much. The pipeline men had already started heating the oil in transit near each station, but the heat did not carry far. It was decided to give the oil the "water cure." The men experimented by sending through different ratios of oil and hot water, and the daily pumping records soon showed gains. At first, the "refinery point of view" was in conflict with this method, but since Point Richmond lacked sufficient fresh water for its own work and Superintendent Rheem found that by heating deliveries to 160° and allowing the water to settle it could be easily drawn off, he accepted the water as a necessary ingredient of the piping and refining process. Pipeline men tried several other means before the addition of intermediate pumping stations solved the problem. Other companies later used other methods: for example, the Associated Oil Company introduced the rifled pipeline constructed with an internal twist to keep the fluid moving in a spiral whirl, with 10 per cent water surrounding the heavy oil.[13]

Difficulties in starting pipeline operations, though different in this area, were not unique in Standard Oil history. In the third month of trouble with delivery, C. N. Payne wrote O'Day a letter full of sympathy for

Forrest Towl, who had "had a long siege of hard work" and, having overcome "new features in pipe laying," had hoped with its completion "that everything would go all right." Payne recalled delays of two months with other lines between the end of construction and successful operation: "The South West Pa. Pipe Line when completed nearly broke Mr. Scheide's heart before he got any oil through it." O'Day wrote soothingly to Towl about his problem: "You must not feel discouraged about it. The elements of success are there I am sure, and that you will overcome all difficulties in good time I am also sure."[14]

Even after the California line was in operation, keeping different grades of oil separated necessitated providing a large storage capacity. The refiners did not want the light oil delivered with the heavy, and large batches of 150,000 to 200,000 barrels of each were run to keep them separate. Lighter oil was pumped through and stored in the new tank farm at San Pablo, some distance from the refinery at Point Richmond, while the heavy Kern River oil was brought forward in the desired quantities, preferably in warmer weather when it could be pumped more easily, although the greatest demand for it was in the winter. Near the producing fields the heavy low-grade oil was stored in earthen reservoirs, which proved satisfactory for oil of gravity of 22° Baumé and less, particularly after Standard Oil tank men had introduced improved techniques in constructing the reservoirs.[15]

Particular problems in rapidly supplying adequate tankage for lighter oils brought out the ever-present pride of Standard Oil pipeline men in their achievements. To Colonel J. B. Maitland, head of the Tankage Department of the National Transit, his right-hand man, William Ogg, who had been sent to head the new work in California, wrote indignantly that he had men "restless in idleness," while contractors engaged by H. C. Breeden were putting up some tanks. Unless he was given full charge of all tank construction in California, Ogg did not want the job. Within a few days both Maitland and C. N. Payne were "very much exercised" by the collapse of two tanks built by a local contractor from tankage cut down and shipped from the East. Payne wrote firmly to Tilford that erection by contractors might be cheaper but that it was not so thorough or so safe. "We [the pipeline men of Standard Oil] have covered the Lima field with second-hand tanks, we have built them in Texas, we have built them in Kansas and Kentucky and are still building more, with perfect confidence that they will be tight and stand full of oil," Payne informed Rogers at this time. "We have never lost a tank since I have been

with the company except by lightning and we have been building constantly. In my judgment experience is worth a good deal in handling material that means the safety of large investments."[16]

Even when the petroleum was stored and pumped with some success, maintenance appeared anything but routine to John Page. In spite of Californians' boast that there were no thunderstorms in the San Joaquin Valley, he lost some tanks there from lightning. Although the soil was normally dry, it contained a corrosive alkali. The line was little more than two years old when he found it necessary to dig up pipe for miles—a more expensive operation than the original digging. Upon removing the asbestos paper covering which had been put on to protect the pipe from water and hold the heat, Page found that it had acted "similar to a poultice"; it retained the condensed moisture, which activated the alkali. Some of the surplus Kern River oil, for which there was not a sufficient market at the time, was poured into the ditch to treat the corroded pipe.[17]

In the meantime, the purchasing policy of the refiners bedeviled the pipeline men. They could deliver only the crude oil that the buyers for the Pacific Coast Oil Company purchased, but they wanted to keep their capacity full and the outside producers satisfied. Although the oil in the West was bought by contract, the Pacific Coast Oil Company attempted to purchase all of certain grades offered in some fields, Coalinga for example. Partly at the suggestion of pipeline men, a sliding scale of price, depending on the gravity, had been introduced. Late in 1903 the market lagged, and, with stocks heavy, the refiners soon reduced prices and for a time also restricted purchases to oil not under 20° Baumé (22° had been the limit before); the producers were restive, and the pipeline men feared for the future runs of their plant. Page complained to O'Day that, while producers had favored Standard Oil's pipeline because the company had gone into the field promptly and done much to develop it by providing an outlet, the current price policy was discouraging new drilling and turning producers to thinking of other pipelines. "I am aware that the Pipe Line Department has nothing to do with the price of oil," wrote Page, "but I thought you might want to know of the producers' feelings in the matter."[18]

The situation bore out O'Day's comments on the uncertainty of the continuity of pipeline profits. When Page earlier had waxed enthusiastic about the large profits of the pipeline on current deliveries, with interdepartment charges based on gathering fees in the East and trunk rates of local railroads, he received a cautioning letter from his superior. O'Day

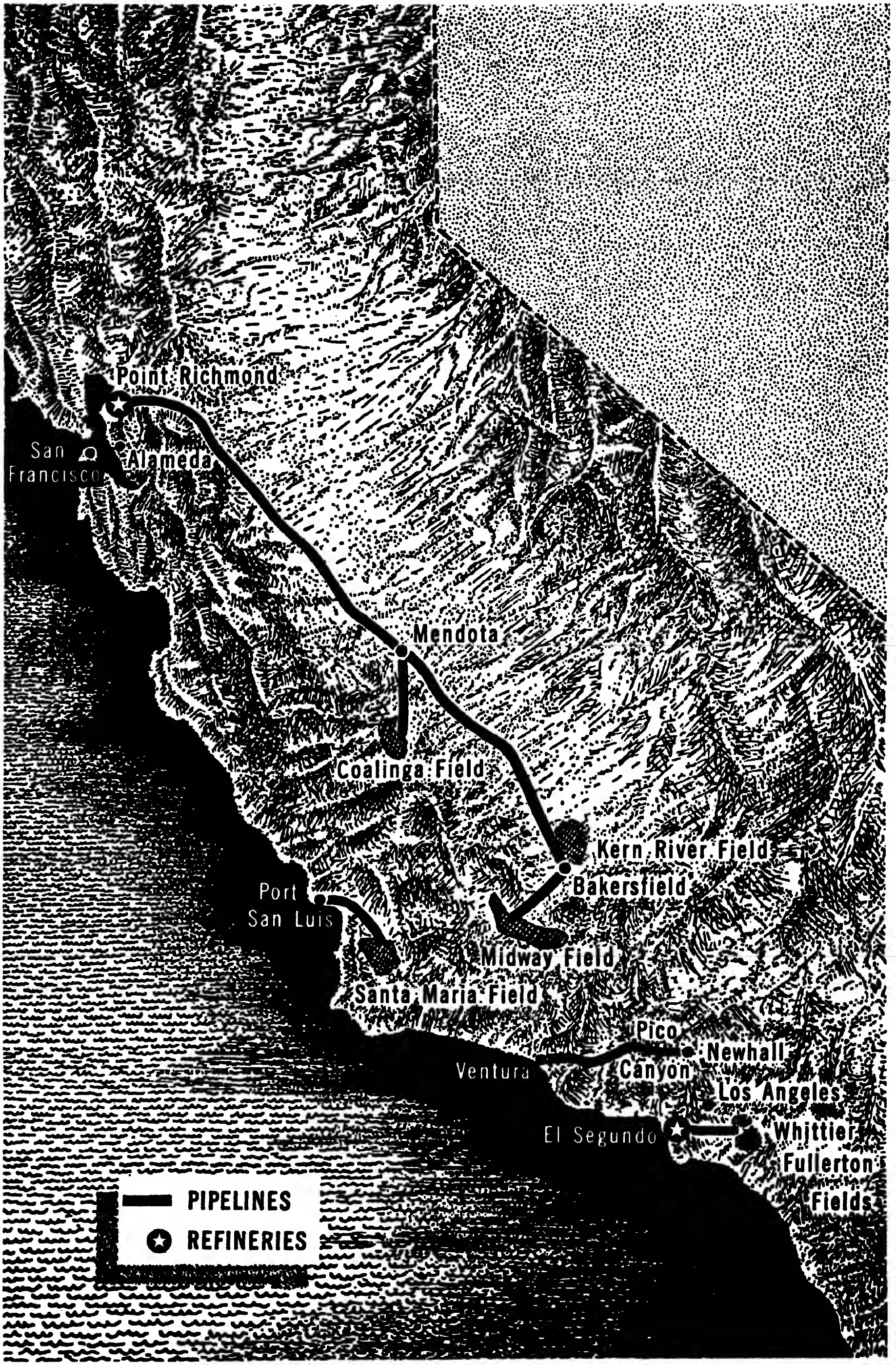
reminded the younger man that his calculations did not include interest on capital "and the greater unknown cost to be determined only with the life of the field."[19] He could have added from his current eastern experience that possible loss of oil to competitors must also be taken into consideration.

O'Day now sympathized with his men, explained the "pipeline standpoint" to top management at 26 Broadway, and interpreted the reply to men in the West. After hearing from H. M. Tilford that he had been instructed to limit purchases, O'Day pointed out to H. H. Rogers that Coalinga was near the coast and that a short pipeline might be built to it by a competitor to take care of the petroleum if Standard Oil did not. Apparently O'Day was given a better understanding of the problems encountered by men handling other functions, for he soon reminded his pipeline men that the situation in California differed from that in the East. In Ohio and Pennsylvania all the oil could be taken; in California there was only a limited market. Until the problems of refining were adequately solved, Standard Oil, which already held a large stock of crude, could not buy all the lighter oil offered, while the quantity of heavy petroleum suitable for fuel oil was produced in even greater excess of a profitable market.[20]

Although this particular situation proved temporary, the pipeline men continued to face the problem of maintaining sufficient capacity in pipelines and storage tanks to care for the oil, and yet of not overbuilding. The increase in production in California and anticipated success in improving techniques of refining soon led to a call for added equipment. Before increasing their facilities, the pipeline men wanted to be reasonably assured that the future volume of business would justify the expansion of their plant. "There seem to be so many uncertainties about the production and things generally in California," O'Day wrote in October, 1904, "that I dislike advising the expenditure of more money than would seem to be necessary to get along from time to time."[21]

Nevertheless, expansion in construction went forward. Nine new intermediate pumping stations were added to improve the flow of oil by reducing the twenty-eight-mile intervals between each pair of the original ten stations; new and larger pumps were ordered from the National Transit shops in Oil City and installed at all the stations; more pipe traveled from the East, and additional loops were laid. The capacity of the line to Point Richmond was increased.

Before the end of 1911 Standard Oil had added many more miles to



Location of Refineries and Pipelines of Standard Oil Company (California), 1911

the trunk and gathering system of its pipelines. By that time the Bakersfield to Point Richmond line consisted of two eight-inch lines throughout its length, while the six-inch branch from Coalinga to Mendota was augmented by another eight-inch loop. By 1907 two eight-inch lines extended this system from Bakersfield to Midway, which four years later was the most productive field in the state. An eight-inch line ran from the rich Santa Maria field, Santa Barbara County, with its wells of great capacity and higher specific gravity, to Port San Luis, by 1905. An old line of smaller capacity (two-inch and three-inch) still carried oil from Newhall (Pico Canyon) to Ventura, where it was loaded in tankers. The final extension in this period was made in November and December, 1911, when a six-inch line was built from Northam to transport oil from the Whittier-Fullerton fields to El Segundo, Standard Oil's large new refinery near Redondo in Los Angeles County.[22]

PRODUCTION, PURCHASE, AND COMPETITION

Perhaps because of the rapid increase in output, and the eagerness to buy crude oil in order to keep producers as satisfied as possible, Standard Oil did not itself become a large producer in California at an early date. It watched developments carefully, however, participated to an increasing extent in production, and as a buyer was one of the important firms in the market.

To keep well informed upon developments and prospects in California, Archbold sent out some of his best production experts. In 1903 Lufkin renewed his acquaintance with the state and was impressed by the growth in the number of the fields and their staying quality. Colonel Carter, after visiting the area with Breeden, Moffett, and H. M. Tilford two years later, wrote an enthusiastic report to Archbold. Producers were complaining about prices, and Carter admitted that three weeks of studying conditions were not sufficient to enable him "to indicate a panacea for all the ills of the producer," or "to point out all the places where producing property" could be found. However, he saw great possibilities in many fields, including San Joaquin, Santa Maria, and Lompoc, and was convinced that there were "other fields yet to conquer."[23]

As an outgrowth of Carter's report, California Standard took a more active part in drilling for crude oil. A separate Production Department, established in 1907, made large outlays for equipment and drilling and achieved substantial success in obtaining petroleum. Following practices pursued in the East, Standard Oil's Far Western producers acquired

proven properties from other companies, some of their largest purchases being in Coalinga and Kern River, partly to maintain a steady flow of oil through the company's pipelines. The producers also undertook wildcatting with mixed success. The company was credited with proving fallacious the belief that there was a break between the east and west sides of the Coalinga area, and with helping to develop new territory in the Midway field. In the latter it was very active and successful in 1909, running some thirty-five strings of tools there at one time. On the other hand, in the Repetto Hills east of Los Angeles, after the drillers had reached 2,000 feet in one well with a rotary drill and 3,400 in another with cable tools, California Standard acknowledged that it had two dry holes, and withdrew.[24]

During these years the men of California Standard faced production problems typical of the fields in the state. Drilling was often in soft formations—shale, sandstone, and clay—classified as "caving material." Occasional hard streaks ("shells") were encountered, which enhanced the difficulty of drilling. In several localities the wells were deep for this period, over three thousand feet. Care had to be taken to prevent caving and to counteract the tendency to drill crooked holes. The producers put casing in immediately after the drill and moved it frequently to prevent binding. As a result, the machinery used was heavier than in the Appalachian region, and a second bull wheel, or "calf wheel," was added to carry the reamers and other tools to enlarge the holes in advance of the casing and to maintain the alignment. Some derricks were of a special type, seventy-two feet high and strengthened by bracing. In some cases, hard formations required the use of special bits on the rotary drills. In several fields the presence of a great deal of water complicated completion of the wells and added to the work of pumping. In all, production in a number of areas was expensive and called for the adoption of new techniques, both by California Standard and by other producers.[25]

One of Standard Oil's production practices in the West elicited considerable favorable comment. In the Midway field water caused much damage to wells, partly as the result of inadequate knowledge of local conditions. Standard Oil began posting on the side of its derricks a notice giving details of the strata through which drilling was done so that others might benefit from this information.[26] In this instance a Standard Oil unit initiated a practice of pooling information in advance of a state bill requiring that an accurate log of drilling be kept.

One federal policy was causing a stir among producers in California by

1909. Under orders of Presidents Theodore Roosevelt and William Howard Taft millions of acres of land had been withdrawn from entry for purposes of conservation. The application of this policy to petroleum land under Taft fell on this state more heavily than on any other. Kern and Fresno county producers were greatly concerned at this turn in the national policy. In the light of Roosevelt's attacks on Standard Oil, the combination could certainly not be considered unduly favored by him, but that did not prevent critics from claiming that the conservation policy would aid big companies. It was stated that the Southern Pacific Railroad and Standard Oil, as holders of much of the land contiguous to the reserves, could suck out the oil from under the protected area![27]

Actually, such criticism made Standard appear a much larger producer than it was in fact. Its net production had risen from 130,000 in 1900 to 2,640,000 barrels by 1911 (see Table 34, Chapter 13), but the output of the state had grown from 4,325,000 barrels to 81,134,000. Taking this period as a whole, California Standard's gross production equaled only 2.3 per cent of that in the state.[28] The company was far more important as a buyer of crude petroleum than as a producer.

The policy of the buyers for the Pacific Coast Oil Company, conforming to practice in the West, differed from that followed by Standard Oil in the Eastern states. Instead of posting a market price each day for different grades of oil, D. G. Scofield and H. C. Breeden negotiated contracts to buy from producers. The latter promised to deliver a given number of barrels within a period of time, often two years, at agreed prices for different gravities of oil. A minimum, usually one thousand barrels, was stated for a delivery, and a maximum set per day and per month. Some few contracts committed Standard Oil to take all petroleum produced by a property. While the seller promised to attempt to meet the total amount in the time stipulated, there was no penalty, other than cancellation of contract, if he could not deliver. Standard Oil also held the option to buy all crude petroleum below the minimum gravity mentioned in the contract, and, in some cases, oil in excess of the stated maximum quantity. Contracts provided for sampling of oil from new wells and the buyer's right to apply the "gasoline test" for "water, sand or foreign substances" to all deliveries.[29]

In some new fields, Standard Oil committed itself to build a pipeline to take petroleum under contract. For example, in 1905 it agreed to lay the line from Santa Maria to the Pacific Ocean, and two years later, when producers signed contracts to sell oil at the reported price of thirty cents

a barrel, Standard Oil added a sixty-eight-mile branch from the Midway and McKittrick fields to Bakersfield.[30]

Many considerations influenced the price paid for crude. Undoubtedly bargaining played some part, but prices in contracts signed at any one time differed little. Producers often worked in close harmony with each other, and their friendly feeling to Standard Oil was a business asset to be guarded by avoiding discrimination. The quality of the oil, its nearness to a refinery, and the availability of a pipeline as well as the markets for the products were the chief conditions influencing price.[31] Undoubtedly the buyer took into account the costs of production in various fields and the unwanted possibility of discouraging output, but occasionally the pipeline men felt the necessity of reminding Standard Oil buyers of the importance of these considerations.

When prices were low or oil was not bought, agitation among producers and some newspapers paralleled that in other fields of flush production, such as Bradford in 1877-1881 and Ohio in 1888. Between 1902 and 1906 production grew rapidly; consumption did not keep up with the flow of raw material; new refining techniques were improved but slowly; new contracts for crude oil were made at low prices; and at times heavy oil was a drug on the market. The average annual price for all California crude dropped from 34.8 cents per barrel in 1902 to 24.5 cents in 1905 and rose only 4.4 cents the next year. When the Pacific Coast Oil Company reduced prices or refused to buy heavy oil because of a weak market or inadequate storage facilities, producers and their supporters were antagonized, accused Standard Oil of attempting monopoly, and sought not only other buyers but other means of transportation. On the other hand, when the Standard Oil unit bought and accumulated large stocks, some critics warned producers of the threat to the market of the large reserves. One observer asserted that a combination of Standard Oil and other large buyers had tied the independents hand and foot during the years 1905-1906.[32]

Defenders of the company countered with the facts as they saw them. Excessive production was the cause of depressed prices, in the view of the supporters of Standard Oil. As they visualized the situation, Standard Oil had been an important factor in creating a market for California petroleum by providing pipelines and storage tanks, building a refinery, and selling the finished products.

The Pacific Coast Oil Company certainly enjoyed no monopoly in purchasing crude during the early years of the century. The Union Oil Com-

pany bought substantial amounts, but the largest buyers were railroads. Both the Southern Pacific and the Atchison, Topeka & Santa Fe entered the market heavily, especially for oil suited to use as fuel for locomotives. As producers, as collectors of royalty oil on the alternate sections which they owned and leased, as purchasers on long future contracts, and as operators of gathering lines, the railroads exercised an important influence in the market. The Southern Pacific particularly caused great concern to Standard Oil's pipeline men, who were eager to keep their lines operating at full capacity. Extant records do not disclose the total volume of Standard Oil buying for the whole period from 1900 to 1911, but during the years 1902-1907, inclusive, the company purchased, including its own production, 27 per cent of the output in California.[33]

Whatever the cause of the situation faced by the producers, various kinds of producers' associations were advocated to improve it. One suggestion was that the producers work with Standard Oil to cut down the supply of crude oil, as had been done on occasion in the Pennsylvania field. Another was that they organize their own pipelines and refineries, while a third type of producers' organization advocated was association to offer a united front to buyers.

Given the growth of a number of new fields and the always pressing problem of finance, producing groups in California tended to attach themselves closely to large companies. The Associated Oil Company, formed in 1901 by producers in the Kern River district, achieved prominence in that field within two years and became quite active at Coalinga. Desiring capital for expansion, Associated turned for aid to the Southern Pacific Railroad Company, acquired extensive pipeline interests in 1906, and continued to work with the railway company in various relationships. In 1904 the Independent Oil Producers' Agency gained a considerable following among producers in the Kern River field. Its avowed purpose was to obtain a more stable market for fuel oil in the state by selling the production of many properties through a common agency. A similar group appeared in the Coalinga area. When prices declined in 1909, the two producers' agencies joined forces and made connections with an integrated corporation, the Union Oil Company; the combined Agency increased its storage facilities; the Union Oil Company constructed pipelines in the San Joaquin Valley and also agreed to market the crude oil of its associate.[34] The last-mentioned function was taken over by Associated Oil in 1910.

California Standard continued to buy outside oil, but the company was

a less important factor in the market after 1906 than in earlier years. Although its own production increased, the Standard Oil unit in 1911 still had to provide for two-thirds of its crude oil needs by purchase from others. Between late 1909 and early 1910, even in the face of crude production much in excess of current consumption, California Standard had to advance its purchasing price from forty cents per barrel to sixty-five cents for oil suitable for its refining purposes. In 1910 one of the more moderate estimates in the press was that the "independents" controlled more than half the output of the state.[35]

KEROSENE FROM WESTERN CRUDE

One major reason for Standard Oil's entry into refining in California was to increase the yield and improve the quality of kerosene from local crude. Standard Oil men needed the illuminating oil to serve the market on the Pacific Coast and to supply the Far Eastern countries by a shorter, less expensive water haul than that from the Atlantic Coast refineries. Refining in California was part of the larger mosaic of operations carried on by the Standard Oil combination all over the world for its "general interest."

The path to profits in refining California crude oil must have seemed unnecessarily strewn with obstacles. All types of petroleum in that state, as indicated by the tables of specific gravity of the crudes from various fields, were heavy.[36] Within the same area great ranges in specific gravity appeared; for example, Coalinga petroleums from different horizons varied widely in character. Almost all California crude had an asphaltic base, with which American refiners had no great experience until California and Gulf Coast crudes were utilized extensively. No really detailed scientific analysis of California crudes was published until 1910. Enough water existed in many deliveries of raw petroleum to cause frothing and boiling over when the oil was distilled by the prevailing methods utilized in eastern refineries. Sulphur was present in all California crudes, in some in sufficient quantity to complicate treating operations. The presence of sulphur, asphalt, and other materials in the oil made the kerosene yield unsatisfactory for the market; the kerosene flowed quickly up the wick, burned rapidly, and smoked appallingly. At the turn of the century it could be sold only after being mixed with eastern illuminating oil in the proportion of 30 per cent western and 70 per cent eastern.[37]

Whether separated into gas oil, fuel oil, and asphalt, or sold as fuel oil without further separation, the residue after the volatile products were

removed entered a highly competitive market. Almost all other manufacturers of petroleum products in the region were concentrating upon gas oil, asphalt, and fuel oil, often in the case of fuel oil with a minimum of modification from the original crude.

The Pacific Coast Oil Company enjoyed certain advantages in the situation, however. Vice-president and General Manager D. G. Scofield, through twenty-five years of experience, was thoroughly familiar with local problems. Standard Oil officials knew the nature of their chief competitors' kerosene and naphtha from marketing their products. Under the basic patent of Eric A. Starke, Pacific Coast turned out the best kerosene made from California crude oil. Starke's process consisted of first removing the refractory substance by treating the petroleum with a solvent and then with sulphuric anhydride, which reduced the smoke and smell common to California kerosene refined by the usual methods. The company already had an experimental laboratory when Standard Oil made the purchase in 1900.[38] Starke continued to work for Pacific Coast, and his efforts were supplemented by others on its staff. Herman Frasch also directed his talents to refining Coalinga crude.

One of the earliest problems to be solved was the site for a new refinery. Two factors motivated the selection of Point Richmond. The new plant had to be located where water was deep enough to accommodate ocean-going tankers, since an overwhelming proportion of the contemplated shipments of refined products was intended for transport by that means. The refinery had to be large in order to serve the contemplated market; Pacific Coast's old West Alameda plant processed only 347 barrels daily during the last eight months of 1900, and the available eight acres of land allowed no room for expansion. In 1901 only a few dwellings of Atchison, Topeka & Santa Fe Railroad employees shared Point Richmond with the Pacific Coast Oil Company; there was plenty of space for expansion.[39]

At Point Richmond Standard Oil men built the largest refinery on the Pacific Coast. It was erected under the supervision of W. S. Rheem, who possessed sixteen years of experience with heavy Pennsylvania crudes at the Eclipse plant of Atlantic Refining and with sulphur-bearing Lima-Indiana oil at Whiting. Construction began on October 28, 1901. By the following July the new plant had received its first deliveries of crude oil. These arrived by tanker from Ventura and by tank car until the completion of the pipeline from the Coalinga region in 1903. Costing nearly a million dollars, Point Richmond boasted from an early date nineteen

stills with a daily capacity of ten thousand barrels of crude oil. The new refinery manufactured all classes of products except paraffin wax and asphalt, and the works soon included an acid plant, a whale-oil processing unit, and a can factory. Within a short time after the Point Richmond plant came into operation, the West Alameda Works were dismantled, part of the equipment being used in the new refinery and the remainder sold as junk.[40]

Standard Oil men in California gradually overcame the technological difficulties met in processing California crudes. While the refiners at Point Richmond continued at first to mix their kerosene with eastern products, Pacific Coast researchers and experimenters laboriously sought to produce a thoroughly marketable illuminating oil of their own. Although by 1904 they had considerably improved the quality of their kerosene, three years later they had more nearly accomplished their goal. David T. Day reported in the *United States Mineral Resources* for 1907 that a kerosene which burned without a smoky flame had been manufactured from California crude "by the aid of much skillful work, involving unusually great expense, and the credit for which is chiefly due to the chemists of the Standard Oil Company." For the year 1907 "experimental expenses" for California Standard were listed at $17,959.08.[41] The chief credit for the improved method went to Eric Starke.

Besides Starke, however, many men, including practical refiners in the plant, continued to contribute to the Standard Oil achievement. As early as 1902, Herman Frasch applied for a patent for distilling Coalinga crude or similar petroleum under a fractionating column with the object of obtaining naphtha, kerosene, and some aromatic hydrocarbons. The patent, granted in 1910, was assigned to Jersey Standard. A year after Frasch's application, J. C. Black asked for a patent for treating California "burning petroleum" with a mixture of fuming sulphuric acid and a gas made up of nitrogen, oxygen, and unconverted sulphur dioxide. That patent, also granted in 1910, was assigned to California Standard. Fuming sulphuric acid had the drawback of practically destroying such fractions as benzol and toluol. Later it was found that liquid sulphur dioxide would separate but not destroy the aromatic derivatives. In the meantime Starke had patented an improved method of treating benzine.[42] Through these and other efforts western crude petroleum was converted into satisfactory products for the market.

While experimenters in California Standard concentrated on improving the quality of kerosene derived from California crude, other individuals

and companies took a much more prominent part in maximizing and improving the output of gasoline. Research in that area of operations began to show results as soon as the demand from automobiles had increased and after the Santa Maria, Midway, and Fullerton fields had begun to provide an expanded supply of petroleum containing a higher percentage of the more volatile fractions. M. J. Trumble, whose first patent (No. 996,736, July 4, 1911) was assigned to the Trumble Refining Company and was soon extensively utilized by the General Petroleum Company, made outstanding contributions; in his apparatus he combined the first successful application in the American petroleum industry of the principles of radiant heat through the use of pipe stills with a primitive fractionating tower for the separation of gasoline, kerosene, and fuel oil. Among prominent names in the list of patentees of "topping plants" were those of H. G. Burroughs and E. I. Dyer. The Union Oil Company tried out both the Dyer process and another known as the Brown-Pickering. Similar additions to the technology of producing fuel oil and asphalt were made by other experimenters and practical refiners. Although many men perfected methods of dehydrating crude oils, F. G. Cottrell and Buckner Speed were credited as the first to devise a practical electrical process for accomplishing the purpose in California.[43]

In the meantime California Standard had expanded both capacity and consumption of crude oil at Point Richmond. During the first full year of operation the plant consumed 3,317,000 barrels of crude; by 1907 its average daily run to the stills was 22,227 barrels. For that year the daily capacity was estimated at 28,727 barrels, of which 6,904 could be processed by batch stills and 21,743 by continuous operation. In 1909 the plant was adjusted to meet the increasing demand for exports to Latin America and the Far East. Two years later $750,000 was appropriated to begin the manufacture of asphalt. Early in 1911 part of the acid plant was destroyed by fire, which perhaps accounted for the estimated capacity figures being lower for that year than earlier. Fortunately, however, though the acid works were situated in the middle of the plant, spacing and plant engineering had been so effective that all other parts of the refinery were saved.[44]

By 1911 Standard Oil officials were taking cognizance of their unfavorable competitive position in the southern part of California by erecting a new refinery—El Segundo. As the name implies, this was the second refinery owned by California Standard. With crude oil cheaply available from fields in the vicinity, refining at Los Angeles had grown to con-

siderable proportions and was entirely in the hands of small independent refiners. Local price cutting by Standard Oil to meet the competition had been greeted by strong opposition from the locally entrenched small manufacturers and marketers. Adopting another tactic, in 1911 California Standard appropriated a reported $1,100,000 to initiate the erection at Redondo Beach, near Los Angeles, of El Segundo, the "largest refinery in the world," a claim released by General Manager R. J. Hanna, probably for the benefit of local refiners. The company purchased 840 acres of land on which to build stills, tanks, machine shops, car shops, carpenter shops, railroad tracks, and office buildings. Plans called for a pumping plant capable of moving five million gallons of water per day to condensers and a twenty-four-inch pipe to carry warm water back to the sea over a turbine wheel which would generate power to run the pumps. Another pump was to lift daily 500,000 gallons of fresh water for boilers. Just 139 days after the beginning of the project, on November 27, 1911, Vice-President W. S. Rheem charged the first stills, which had a daily capacity of fifteen thousand barrels.[45]

The number of refineries reported from California had grown rapidly. Although many were really either topping units or asphalt producers rather than being complete refineries, several turned out a wider range of products. In 1901 only eleven refineries were reported; in 1904 there were thirty-four with an estimated gross still capacity of about 37,500 barrels daily. Although some plants had come and gone, by 1911 the number of refineries was reported at forty-one.[46]

At that date California Standard's role in the refining operations of the state was significant, though not preponderant except in making kerosene. Both the Union Oil Company and the Associated Oil Company constituted worthy and strong competitors. Standard Oil owned and operated two of the three largest units, the third being the Oleum plant of Union. Only the latter and Point Richmond ranked as true refineries in the full sense of the term: they manufactured all classes of products, except paraffin wax. The Standard Oil plant sent out a range in each category of naphthas, kerosenes, paraffin oils, lubricating oils, greases, gas oil, fuel oil, and asphalt. Point Richmond and El Segundo together consumed slightly less than 20 per cent of the petroleum produced in the state. It must be remembered, however, that only a small proportion of the crude oil extracted in the state was truly refined and that California Standard gave far more attention to the manufacture of refined oil than did many of its competitors.[47]

MARKETING IN THE FAR WEST

Standard Oil marketers in the Far West from 1900 to 1911 faced some situations which differed from those in domestic marketing in the East and others which, though similar, had their own local manifestations. As a result of the improvement in local refining, marketers shifted from relying on supplies imported from the East to selling the enlarged quantity of a variety of products refined in the West and to increasing sales for export. This was also the decade in which the rapidly increasing demand for gasoline not only created new problems of supply but also called for new marketing techniques. The competitive pattern in California changed markedly after 1906, and, as will be seen later, paralleled that for the whole United States.

Standard Oil marketers in the West served a large area. Until February, 1906, Iowa Standard operated in a number of states—California, Arizona, Nevada, Oregon, Washington, Idaho, and part of Montana. Its properties in the last two states were then sold to the Continental Oil Company. In October of the same year California Standard took over all the remaining properties and activities of Iowa Standard within the United States, together with other "home trade" operations in Hawaii and Alaska.[48]

Given the nature of California crude oil and the yield of various products, the refining techniques of the first decade of the century created certain marketing problems. In 1907, of the total output by Point Richmond, only 4.7 per cent was naphtha and gasoline, 20 per cent kerosene, and almost 70 per cent fuel oil. The approximately 5 per cent remaining was made up of acid oil (also used for fuel), lubricating oil, gas oil, paraffin oil, paraffin distillate, mineral seal oil, and tar, in that order.[49]

California Standard soon refined almost all the kerosene needed for home consumption in the West. In the first years of the century Standard Oil had mixed eastern kerosene with western. By 1906, however, 86 per cent of Standard Oil's total Far Western sales of kerosene was being refined from native crude;[50] the remainder came in the form of top grades from Whiting.

By 1911, in fact, an overwhelming proportion of Point Richmond's kerosene was going abroad. Beginning with the improvement of refining methods, in 1904 shipments into foreign trade equaled 73,026 barrels; within two years the total reached 1,046,278. This was considerably in excess of Iowa Standard's domestic sales of 412,369 for the year. The small export of 1910 was followed the next year by a total which equaled

about 80 per cent of the refinery's output of kerosene and included 1,604,195 barrels to China alone. All products destined for the Orient were sold to Standard Oil Company of New York for export, while smaller quantities were sold to Waters-Pierce for the west coast of Mexico and to commission merchants for various markets in western South America.[51]

The situation with regard to gasoline was quite different from that for kerosene. The sales of naphtha and gasoline by Standard Oil in "home trade" in the West mounted rapidly, so that the total of 1,050,977 barrels for 1911 was a 500 per cent increase over sales in 1900. In the meantime kerosene sales in the same area had increased only 21 per cent, had been passed by gasoline and naphtha in 1908, and amounted to only 571,532 barrels in 1911.

As the demand for gasoline rose, the western company depended on outside sources of supply. In 1906 the output of local refineries satisfied 92 per cent of Iowa Standard's total sales of 412,365 barrels of naphtha and gasoline. As sales grew, however, and California crude yielded only a small percentage of these products, imports were required to meet the marketers' needs. The additional gasoline for California Standard came from Sumatra via The Asiatic Petroleum Company under a contract dating from 1906.[52] It was obvious why Standard Oil was strenuously seeking a method to maximize the yield of gasoline, a project concentrated at Whiting, while Trumble and others were so active in inventing new "topping" processes in California.

In other petroleum products marketers on the Pacific Coast experienced no difficulty with supplies. The acid oil and some of the fuel oil were burned at the refinery, the remainder being sold to railroads, steamship companies, factories, and other industrial consumers who had been convinced of the efficacy of oil as fuel through low prices and the campaigns of Union Oil and others. Since competitors had developed the fuel oil market, Standard Oil did not have to undertake so much educational advertising as in the Middle West and East during the 1880's and 1890's respectively. As early as 1901, however, Standard Oil began a vigorous campaign to expand fuel oil sales to industrial users. Circulars to prospective customers pointed to the extensive Standard Oil experience with oil as fuel in the East and offered the assistance of experts to aid users in the Far Western area. With the exception of special grades furnished by the Vacuum Oil Company, by 1907 Point Richmond was able to meet its marketers' requirements for lubricants. Gas oil supplied the growing demand from manufacturers of artificial gas in various cities, probably

stimulated in part by activities of Standard Oil marketers experienced in eastern sales.[53]

Standard Oil merchandisers on the Pacific Coast in general utilized the techniques of distribution adopted in the East but modified them to meet western conditions. As the market grew and the company took over the jobbing function in more places, the number of bulk stations rose from ten in 1887 to eighty-six in 1908. Of the fifteen main bulk stations in the latter year, twelve were within the United States, while Honolulu, Nome, and Dawson had one each. In 1900 the Pacific Coast Oil Company had but one tanker, the *George Loomis,* chiefly used for the transportation of crude; seven years later California Standard owned five tankers, in addition to five barges and four small craft, for carrying crude and finished products between the ports on the long coast. The variety in climatic conditions and terrain, as well as the fact that population was sparse and scattered except at a relatively few points of concentration, also had an effect on methods of packaging and distribution. Cans and cases, as well as barrels and drums, were a prime requisite for sales in the semiarid, arid, or mountainous sections of Western states. Tank-wagon deliveries were gradually adopted where the volume of trade made them feasible. Of the total kerosene sales in 1906, however, only 27 per cent was from tank wagons, while 45 per cent was in cans, 21 per cent in barrels and drums, and almost 7 per cent in tankers or tank cars to large buyers. Comparable percentages for naphtha and gasoline were 32.9 by tank wagon, 18.5 in cans, 35.4 in barrels and drums, and 13.3 in tankers or tank cars.[54]

Prior to 1906, both to obtain sufficient local supplies and to maintain predominance in the sale of kerosene and gasoline in the Far West, Standard Oil followed practices often used in the East. Until 1906 Standard Oil's western marketers enjoyed the benefit of special contracts to sell the lighter products of two competing refineries. For the seven years 1898 to 1904 Iowa Standard marketed all the kerosene and naphtha manufactured by the Puente Oil Company of Los Angeles. In 1899 Union Oil Company made a similar agreement. While concentrating on its own sales of crude oil and industrial fuel oil, Union Oil sold a large volume of crude oil and all its kerosene and naphtha distillate to the Pacific Coast Oil Company. In 1903 Standard Oil's officials offered to purchase all the refining, marketing, and transportation facilities of the Union Oil Company, but the deal foundered upon the latter's condition that the sale should be accompanied by a contract to purchase a large volume of crude oil. Under the last contract for products, signed in 1904 and running for

two years only, Pacific Coast agreed to buy 600,000 barrels of crude oil annually and Union Oil agreed to sell all its kerosene and naphtha distillate to the Standard Oil unit. In the meantime, Iowa Standard had bought out several small jobbers of kerosene and naphtha and had operated at least two of the firms for short periods under the original or similar names, thus qualifying them as "bogus companies" so much criticized at that time.[55]

Meanwhile, increased attention was given by the marketers to methods of sales of gasoline. In company with several other corporations, California Standard is reported to have established the first service station for motorists in the United States. Regardless of the claim to primacy, in the spring of 1907 the Seattle office of California Standard started a filling station. The equipment included a feed line from the main storage tanks to a thirteen-gallon tank, a glass gauge, a valve-controlled hose, and a display of oils and greases on two shelves. The local Standard Oil marketers invited the public to "come and buy its gasoline at the same price the company sold to garages."[56] A photograph remains to preserve the memory of this early example of a new device of salesmanship. The purpose was to eliminate the slow and cumbersome filling of automobile tanks from cans, to reduce costs to consumers, and to meet the competition of a rival who had taken over most of Standard Oil's customers by price reductions. The incident also points up the general growth in competition in the marketing of refined petroleum products in the West.

Iowa Standard's marketers utilized price changes in various ways. Selling prices of kerosene during the early years of the century displayed the seasonal fluctuations which had characterized the market for illuminating oil since 1859—higher in the winter when demand was high and lower in the summer when demand was slack. Statistics of tank-wagon selling prices show that Standard Oil men kept relatively high prices and wide margins between cost prices and selling prices at some points of virtual monopoly and that they followed competitive prices down and took book losses in order to "retain" trade in other cities. At one point Iowa Standard cut prices and endured book losses in advance of the appearance of competition from other sellers of kerosene from tank wagons. Given the net earnings on other functions, these losses on marketing did not necessarily mean a per unit actual loss on the gallons on which prices were cut.

During the years 1902-1906 in Seattle, where Iowa Standard never had less than 95.3 per cent of tank-wagon sales of kerosene, prices varied but

were kept relatively high. Margins between cost and selling prices on sales of Water White illuminating oil delivered by tank wagons ranged from a low of 2.16 cents per gallon to a high of 5.55 cents. The margin tended to hover around three cents per gallon for four out of the five years and declined when competition appeared. Similar conditions prevailed in Portland.

During the same years, Iowa Standard reduced prices in Los Angeles to retain a share of the trade there. In that area small refiners of local crude had two advantages over Standard Oil: transportation costs on both their crude oil and refined oil were extremely low, and kerosene constituted a by-product of asphalt manufacture. To acquire a proportion of the local kerosene market, the independents began selling their by-product, kerosene, at reduced prices, which Iowa Standard, according to H. M. Tilford, followed downward. Marketers of his company began to show book losses on Los Angeles sales in July, 1902, and the losses ranged from 0.15 of a cent per gallon to 3.47 cents during the next four and a half years. Losses reached their peak in late 1904 and early 1905 after the Puente Oil Company had begun selling its own refined products. The price cutting helped the local refiners to get a local market; their percentage of kerosene sales in the Los Angeles area rose from 13.4 per cent in 1902 to 33.4 per cent two years later, though their proportion had declined to 21.6 by 1906.[57]

Although Iowa Standard declared that it followed competitors in cutting tank-wagon prices in Los Angeles, it made the first move in San Diego. Apparently deciding to discourage any competition whatsoever from Los Angeles refiners, Standard Oil men reduced the tank-wagon delivery price of Water White kerosene a total of four and a half cents per gallon between April, 1903, and August, 1904. Perhaps the decision was inspired by the loss of 0.2 of one per cent of sales in 1903, though the independents had none of the market in the years before and after. Competition from sellers of artificial gas and electricity for lighting may well have been a factor in the price reduction. In any case, Standard Oil marketers reduced prices, and from November, 1903, to December, 1906, showed in their accounts losses ranging from 0.39 of a cent per gallon to 2.09 cents.[58]

Two observations emerge from a consideration of the data on southern California. In San Diego, Iowa Standard had practically no competition from outside kerosene; Standard Oil prices were kept so low that competitors chose not to try to meet them. Iowa Standard did not follow the

course of reducing prices and then raising them to prohibitive levels after the disappearance of competitors, an often alleged pattern of action. Secondly, as the growing strength of independent oilmen in the Los Angeles area shows, Standard Oil did not kill off competitors there by cutting prices. In fact, to meet the competition California Standard had to build a refinery near the city in 1911.

In order to meet or restrict rising competition, or perhaps just to increase sales, Iowa Standard sharply reduced its net earnings per unit on marketing during the early years of the century. The calculated earnings of the marketing unit on all products declined from \$1.42 per fifty-gallon barrel in 1899 to \$1.22 in 1906, while those on kerosene dropped from \$1.43 to \$0.90 and on naphtha, including gasoline, from \$1.56 to \$0.69.[59] No detailed information is available on marketing returns per unit of different products during the last part of the decade, but, while the volume of sales rose, the total net earnings on marketing did not. (See Table 33.)

California Standard's relative position in the Far Western market changed rapidly after 1906. Its percentage of kerosene sales in domestic trade dropped from 95.5 per cent of the total in its area in 1906 to 82.2 per cent five years later. Its sales of naphtha and gasoline manifested more fluctuations and suffered a greater relative loss in its proportion of the market; from 84.6 per cent in 1906, California Standard dropped to 64 per cent in 1908. Only by imports of gasoline from Sumatra did it increase its share in 1911 to 70.5 per cent, itself an acceptable proportion of the market to any company but one which had held much more a decade earlier.[60]

MEASURING THE ACHIEVEMENT

Viewed from several different angles, the achievement of Standard Oil in the Far West during the years 1900 to 1911 was impressive. The investment had grown rapidly, had yielded good profits, and had contributed materially to the expansion of the petroleum industry in the state of California.

The figures for capital and assets indicate the phenomenal growth of Standard Oil's western operations between 1899 and the end of 1911. In December, 1899, Iowa Standard's capital stock was \$1,000,000 and its net value \$1,573,453. Twelve years later California Standard, in which all functions had been vested, had a capital stock of \$25,000,000 and net value of \$39,213,195. The source of the last-named figure is shown in the

following data from the 1911 balance sheet, as adjusted after deducting depreciation:[61]

Pipelines and storage	$11,892,219
Crude oil	9,747,125
Producing	8,015,295
Marketing	
Plant and equipment	2,651,450
Accounts receivable	3,347,498
Merchandise	4,838,160
Refining	5,940,781
Shipping	1,478,755
Other investments	494,704
Cash	480,479
Office equipment	51,969
Total Assets	$48,938,435
Accounts payable	9,725,240
Net Value	$39,213,195

The output of the Standard Oil's western firms grew with the investment. Data are not available for the growing rate of activity in all functions, but statistics on some operations provide revealing impressions. Net production of crude oil rose from 130,150 barrels in 1900 to 2,640,035 in 1911. In the meantime, domestic sales of naphtha and gasoline mounted from 174,288 barrels to 1,050,977 and of kerosene from 440,927 to 571,532, while exports took over 80 per cent of the output of illuminating oil in 1911.[62]

Because of the rapidity of that expansion, earnings during these years, set forth in Table 33, naturally manifested considerable variability. The spectacular increase in earnings from transportation in the years 1904-1906 mirrors the completion of the initial pipeline system and the acquisition of a small fleet of ocean-going tankers. The loss shown for producing operations in 1907 came from heavy expenditures by the company in that year which were to contribute to higher earnings later. Earnings from manufacturing activities show the effect of success in finding an improved method of refining. They attained a peak in 1907, thereafter beginning a decline probably traceable to lower prices charged by the refinery to marketing units. Though not devoid of fluctuations, marketing operations maintained a fairly consistent record in the face of increasing volume of sales.

Many questions arise in evaluating net earnings by function in an integrated company, but few of them can be discussed here. Information is lacking on many points in connection with the Far Western companies,

Table 33 CLASSIFIED NET EARNINGS OF FAR WESTERN STANDARD OIL COMPANIES, 1899-1911

	Producing	*Transportation*	*Manufacturing*	*Marketing*	*Interest*	*Net Earnings*
1899	......	......	......	$ 788,704	......	$ 788,704
1900	$ 8,971	$ 16,771	$ (11,928)*	578,717	......	592,531
1901	37,585	31,828	5,492	817,778	$ (16,298)	876,385
1902	117,773	31,362	(29,050)	1,093,450	(87,337)	1,126,198
1903	204,672	59,271	145,425	1,089,418	(132,360)	1,366,426
1904	174,570	1,046,751	428,864	781,982	(174,122)	2,258,045
1905	25,748	736,204	467,968	1,082,310	(293,119)	2,019,111
1906	50,593	1,744,190	1,030,472	957,664[a]	(115,236)	3,667,683
1907	(136,003)	688,068	3,081,888	975,545[a]	9,268	4,618,766
1908	533,645	780,946	2,247,596	846,864[a]	11,535	4,420,586
1909	294,620	340,023	2,371,814	1,028,805[a]	(197,098)	3,838,164
1910	1,959,022	......[b]	2,871,140	1,062,839[a]	(423,155)	5,469,846
1911	1,072,695[c]	......[b]	1,940,257	727,065[a]	(498,786)	3,241,231
Total	$4,343,891	$5,475,414	$14,549,938	$11,831,141	$(1,916,708)	$34,283,676

* Parentheses denote loss.

[a] Iowa Standard was the Standard Oil marketer in the Far West to 1906. Data for the years 1906-1911 on marketing include earnings of both California Standard and Iowa Standard, which was winding up its old accounts and showed earnings of $573,978, $36,003, $10,245, $27, $7, and $30 for the respective years.

[b] California Standard apparently incorporated earnings from pipelines and floating cargo carriers with those from production during 1910 and 1911.

[c] The earnings from production for 1911 include $99,638 from the California Natural Gas Co. The earnings from natural gas were reported separately from those of oil production for the first time in that year.

Source: SONJ, Consol. Accts., classified earnings of Pacific Coast Oil Co., Iowa Standard, and California Standard.

and some attention is given to the subject in the later chapter on finance. Considerable concern was shown by Standard Oil men, interested in different functions, over intercompany and interdepartmental charges, and the problems of adjusting these and weighing the results are obvious. A change in accounting or alterations in charges could change the allocations of earnings with the greatest of ease. At first, at least, the Pipe Line Department of the Pacific Coast Oil Company charged the refinery according to gathering fees established in the East and set trunk-line rates to correspond to freight schedules on western railroad lines.[63] The refinery probably compensated the Producing Department according to current prices paid to outside producers; earnings, therefore, need to be evaluated in the light of a number of factors.

Jersey Standard, the owner, benefited from its participation in the operations in California and the innovations achieved. While Jersey Standard's investment in stock of the western companies varied over the decade, it rose to $25,000,000. Total dividends paid by the three far western affiliates amounted to $20,611,000 over the period under review. The parent company also received interest upon loans to the net amount of $1,916,708.[64]

When Standard Oil Company (California) went its separate way at the end of 1911, it carried with it undivided profits of $14,213,195. These and other assets became the property of the individual stockholders, who received shares in the going California concern at the time of the division of Jersey Standard into thirty-four companies.

In 1911 the Standard Oil Company (California) ranked as one among several important integrated corporations in the Far West. Its relative position within the petroleum industry of the area varied according to the function considered. Its gross production for the years under review accounted for little more than 2 per cent of the total for the state, though its volume rose rapidly late in the period. It had been and continued to be a large buyer of crude petroleum, but it had ample competition in this phase of operations. Standard Oil played an important role in the development of the famous San Joaquin Valley, particularly with its pioneering in the difficult task of building a long pipeline in territory where new technical problems were encountered, but it by no means had a pipeline monopoly. In 1911, California trunk pipelines totaled about 1,600 miles, of which 1,250 served the great fields of the San Joaquin to the seacoast. This mileage was divided among four companies, the Stand-

ard Oil share being about a quarter.[65] Without doubt Standard Oil chemists and the Point Richmond plant took the lead, based on patents granted by the federal government, in manufacturing kerosene and naphtha till just at the end of the period. Even then California Standard owned two of the three largest refineries on the Pacific Coast. In marketing, Standard Oil broadened its participation to encompass a larger share of the market for fuel oil and asphalt. Although it increased its volume of sales of kerosene and naphtha, its share of the market for these products steadily declined. Competitors had moved more rapidly and definitely wrecked the early monopoly of Iowa Standard in disposing of light products. Viewed in the large, Standard Oil attained and held the position occupied in 1911 only by a large investment, by innovations in refining, and by applying operating principles learned through decades of experience in the eastern fields.

Mere evaluation of shares in the various functions scarcely reflects the impact of Standard Oil upon the California petroleum industry. When the Easterners entered the field, other companies were already active, but the advent of a well-financed, aggressive organization with plenty of skill and experience had a marked effect in the area. Undoubtedly Standard Oil's decision to develop producing, piping, and refining in California arose from the managers' judgment that the time was ripe for the state's development. Indeed, the next decade witnessed a very rapid growth in California's petroleum industry. The editor of *The Petroleum Review*, Paul Dvorkovitz, whose pen seldom missed an opportunity to extol the importance of a well-organized firm in developing an area, assigned Standard Oil significant influence on two counts. By coming into the market as a large purchaser of oil itself, by building pipelines, by improving methods of refining, and by finding wider markets for products, the combination stimulated production directly. In addition, its entrance also offered confidence and encouraged vigorous competition, which spurred the Union Oil Company, the Associated Oil Company, and others to contribute greatly to the quickening development of the western petroleum industry.[66]

Chapter 13

Participation in Expanding Domestic Production of Crude Oil

During the first decade of the twentieth century the Standard Oil Company (New Jersey) lived through and participated in a dramatic change in crude oil production. While supplies of oil dwindled in the Appalachian and Lima-Indiana areas, the flow of petroleum increased at an unprecedented rate not only in California but also in Indian Territory (later Oklahoma), Illinois, Texas, and Louisiana. The continually changing supply situation posed numerous problems of adjustment. Types of crude oil varied between regions and from field to field. The appearance of natural gas as well as petroleum in all areas, especially in West Virginia, called for positive action. Demands on "the pipeline interest" were more exacting than ever before. Most revolutionary for the industry, and somewhat disturbing to Standard Oil officials, was the wide geographical dispersion of commercial production, in contrast with the previous concentration in relatively restricted areas. These dynamic developments contributed to a tremendous increase in the rate of growth of the American industry and created a new competitive pattern which affected all phases of Standard Oil operations.

The increased complexity and geographic spread of the operations in petroleum and natural gas gave rise to the incorporation of new affiliates of Jersey Standard and to increased attempts to co-ordinate the management of them. On the Big Board, as earlier, Archbold represented production of crude oil, being addressed in letters from operating men as "the head of the producing department,"[1] a loose phrase to cover the function. Frequent conferences were held by general managers of producing companies. John Worthington, the outstanding field man of the South Penn Oil Company, joined the staff at 26 Broadway in 1902. In the same year the natural gas interests within the combination were reorganized. Among the directors of Jersey Standard, H. H. Rogers represented this

newly important segment of the organization, as well as the pipeline interest, during the great period of building which preceded his death in 1909.

THE APPALACHIAN REGION

In the Appalachian fields the managers of Jersey Standard's affiliates faced the problems of declining production and well-organized, imaginative competition. Producing companies had to adjust their methods to dwindling output. Pipeline men fought to retain runs into their system as rival pipelines vigorously attempted to obtain for their allied refineries the petroleum best suited to their needs on the basis of location and quality of oil.

Petroleum production in the Appalachian region suffered both a relative and an absolute decline during the decade in which the industry grew so rapidly. During the 1890's increasing output from West Virginia and southeastern Ohio had compensated for the falling production of New York and Pennsylvania. In 1900 production in the Appalachian area reached its peak of 36,295,443 barrels. This was the last year in which the region accounted for more than 50 per cent of the production in the United States. By 1911 its output had fallen by more than a third, to 23,749,832 barrels, which was only 10.8 per cent of the total production in the country.[2]

The South Penn Oil Company and The Carter Oil Company were the chief Standard Oil producers in the Appalachian area. Of these, the more important was the former, which in 1902 also took over the Eastern interests of the Forest Oil Company. (See Table 34.)

South Penn afforded an example of able management meeting the unpleasant problems of contraction. W. J. Young, who succeeded Noah Clark as vice-president and general manager, led the company until 1906. As much a banker as a production man by training, Young had had long experience with J. J. Vandergrift and the Forest Oil Company and had the reputation for knowing how to make decisions, handle men, and inspire confidence. His successor, E. E. Crocker, was a competent, practical man, trained in the technical details of production. Their responsibility was the discouraging one of management in declining fields where one task was to shut down well after well. South Penn's net production fell from its high of 8,304,000 barrels in 1900 to 4,549,000 in 1911. To operate a company successfully in this area called for strict economies and new methods.[3]

Table 34 ANNUAL NET[a] PRODUCTION OF CRUDE OIL BY AFFILIATES OF STANDARD OIL COMPANY (NEW JERSEY), 1899-1911

In thousands of barrels of 42 gallons

	South Penn Oil Co.				Hazelwood Oil Co.[c]	The Carter Oil Co.	Misc. Gas Cos.[d]
Year	*Pa. & N. Y.*	*W. Va.*	*Ky.*[b]	*Total (Net)*	*Pa.*	*West Va. & Ohio*	*Pa., Ohio, West Va.*
1899	1,322	5,735	7	7,064	25	1,147	
1900	1,293	7,003	8	8,304	26	1,496	
1901	1,125	6,054	12	7,191	25	1,436	
1902	1,091	6,490	18	7,599	23	1,348	
1903	2,451	5,507	95	8,053	21	1,232	
1904	2,259	5,589	138	7,986	20	1,211	
1905	1,973	4,908	107	6,988	22	1,222	
1906	1,829	4,065	92	5,986	25	1,171	69
1907	1,630	3,569	94	5,293	27	1,031	61
1908	1,498	3,243	87	4,828	40	840	59
1909	1,391	3,624	59	5,074	28	889	55
1910	1,316	3,710	60	5,086	26	987	54
1911	1,237	3,241	71	4,549	25	1,075	44

Table 34 (Continued)

Year	Forest Oil Co.[e] Pa.	Forest Oil Co.[e] Kans.	The Prairie Oil & Gas Co.[f] Kans.	The Prairie Oil & Gas Co.[f] Okla.	The Ohio Oil Co. Lima-Ind.[g]	The Ohio Oil Co. Ill.	S. O. Co. of La. Louisiana	Corsicana Petroleum Co. Texas[h]	S. O. Co. (Calif.)[i] Calif.	Standard Oil (New Jersey) Total Net Production[j]
1899	2,113	62			7,669					18,080
1900	2,159	64			7,716				130	19,895
1901	1,823		107		8,098				149	18,829
1902	827		93		7,855				95	17,840
1903			76		7,798			46	108	17,334
1904			116		7,519			37	102	16,991
1905			112	101	6,627	28		29	81	15,210
1906			70	121	5,583	1,118		38	51	14,232
1907			50	1,242	4,300	5,964			664	18,632
1908			40	1,206	3,360	8,935			941	20,249
1909			35	1,901	2,839	9,309			1,184	21,314
1910			30	4,295	2,452	12,526	323		2,173	27,952
1911			28	5,230	2,000	13,254	1,525		2,640	30,370

[a] Net production refers to gross production minus oil royalties. The net figures are between 5/6 and 7/8 of gross production. The figures for 1899 are of Standard Oil Interests.

[b] The production in Kentucky was by The New Domain Oil & Gas Co., a subsidiary, of which 50% had been purchased by the South Penn Oil Co. in 1892, and the balance by National Transit Co. later.

[c] In 1905 National Transit Co. transferred its 35.9% interest in the Hazelwood Oil Co. to the Standard Oil Co. (New Jersey). The figures of production given above represent the net interest of Standard Oil.

[d] The records of production for the gas companies in Pennsylvania, Ohio, and West Virginia are incomplete.

[e] The production of the West Virginia Oil Co. and the Washington Oil Co. is included with the data for the Forest Oil Co. and the South Penn Oil Co. The figures for the Washington Oil Co. from 1900 to 1902 are included with those of the Forest Oil Co., after which they are in those of the South Penn Oil Co. In 1904, the year of its greatest production, according to available statistics, the Washington Oil Co. accounted for only 76,463 barrels.
The South Penn Oil Co. bought the Eastern interests of Forest Oil Co. in 1902. The figures for production of Forest Oil Co. are only approximate, having been calculated by deduction from the total for Standard Oil Co. (New Jersey) shown on Defendant's Exhibit No. 266, *U.S.* v. *SONJ*.
The Prairie Oil & Gas Co. took over the production of Forest Oil Co. in Kansas in 1901.

[f] The division of the production of The Prairie Oil & Gas Co. between Kansas and Oklahoma from 1905 to 1911 is only an estimate.

[g] Lima-Indiana data for 1905-1911 were obtained by deducting Illinois production from the total of The Ohio Oil Co.

[h] The production record for Corsicana Petroleum Co., given as Waters-Pierce Oil Co. in the source, is incomplete. Corsicana Refining Co. held shares in the Corsicana Petroleum Co., a producing unit.

[i] The figures for the Standard Oil Co. (California) prior to 1907 are those of its predecessor, the Pacific Coast Oil Co. These data were reduced 1/6, the royalty paid, to make the figures those of net production.

[j] In *U.S.* v. *SONJ*, Defendant's Exhibit No. 266, the totals are the same as given above, except for 1903 to 1906, when they were 17,319,907, 16,904,030, 15,143,371, and 14,052,113 barrels.

Source: SONJ, collection of predissolution data; *U.S.* v. *SONJ*, XIX, 627, Defendant's Exhibit No. 266.

South Penn drilled new wells, used available methods to effect secondary recovery from old ones, and introduced or extended the use of new production techniques. To increase the productivity of old wells the company cleaned them out, deepened holes, and applied hot oil, acid, air pressure, and water pressure. Water-flooding increased the output of some wells but was not particularly successful with known techniques. Although the company bought proven territory when a good opportunity offered, it did most of its own wildcatting in these years—with some success. South Penn also undertook some of its own actual drilling, a new policy for a Standard Oil producing company. This was recommended by several advantages: information on results could be kept secret; and the company had its own expenses against which to measure drilling contracts. A step forward after 1902 was the refusal by the superintendent in charge of negotiating drilling agreements to demand or to accept the "kick-back" which contractors had been accustomed to pay in order to obtain contracts; though the move had moral overtones, it probably also reduced costs.[4]

Like other petroleum producers, South Penn used metal equipment to an increasing extent. Though superintendents continued to prefer manila cable for drilling because of its resiliency, about 1900 they adopted wire cable for running cleaning-out tools. To carry this equipment, which weighed less than that for drilling, South Penn constructed inexpensive pipe derricks, which received favorable comment in technical journals. In 1903 the producing company bought from the Pittsburgh Carnegie plant of the United States Steel Corporation several heavy eighty-foot-high derricks for drilling deep holes—about three thousand feet—in western Pennsylvania and West Virginia. The steel derricks could be easily dismantled, moved, and bolted together for another well.[5]

Electricity had been utilized in the oil fields earlier, but South Penn paid enough attention to its application to gain the reputation of a pioneer. H. H. Rogers was credited with suggesting the investment in a large electric plant at Folsom, West Virginia, in 1903. Natural gas engines, with a steam plant in reserve, drove dynamos generating electricity which was transmitted to motors at the wells. In August, 1904, Young reported enthusiastically to Archbold that already 230 wells were being pumped electrically and that the monthly expenses, including all labor, fuel, and interest on the investment, were only $19.27 per well. South Penn added many more electric motors in the following years; the company used them for pumping wells and pulling the tubing for clean-

ing; and after experimental work by its chief engineer, in 1906 special motors were built for drilling.[6]

Hidden behind the declining production statistics of The Carter Oil Company was also a considerable amount of activity and ingenuity. The doubling of the capital of the corporation in 1901 to the $2,000,000 provided for in the charter reflected increased leasing and drilling operations.

In an attempt to keep up its volume of production in an area where few wells were "stayers," Carter Oil went into a number of new districts, chiefly in Roane, Ritchie, Calhoun, and Jackson counties in West Virginia, and in Monroe, Fairfield, Hocking, and Perry counties in Ohio. In some areas the corporation acquired partly tested territory, while in others it obtained undeveloped property directly from the landowner in return for a royalty of one-eighth of the production. The bonus paid, if any, was small. Carter Oil then did its own wildcatting, and the low initial cost of the property helped to compensate for a sizable number of dry holes in some fields.[7]

In spite of all these efforts, the production of Carter Oil fell off, but its income was satisfactory, even if not high compared with that in new areas. The net annual production for the twelve years 1900-1911 averaged only 1,116,500 barrels, and for the ten years 1900-1909 the minutes show a record of dividends averaging annually 22.4 per cent on capital stock.

While producing companies in the Appalachian regions met the hard task of finding more oil and of economizing, the managers of Standard Oil's pipeline companies in that area faced similar problems. They adjusted to declining runs both by cutting expenses and by vigorously fighting competitors to maintain their runs as high as possible. At the same time they built new lines to serve producers in those districts which were expanding.

In November, 1901, Standard Oil men organized the Cumberland Pipe Line Company, Inc., a Kentucky corporation. It soon built a trunk line from Olympus, Tennessee, through Somerset, Kentucky, to Braden Station, Tyler County, West Virginia. The usual delays in getting rights of way and receiving delivery of pipe were augmented by working in wild, roadless country, and by the occurrence of heavy floods. Branch lines to producing areas were built at the same time. An example of the customary policy of encouraging producers in new fields was C. N. Payne's recommendation for a branch to serve a small district: "It seems to us here that

the line ought to be laid not as a paying investment but as a means of securing oil and stimulating operations."[8]

Two facts made the competition for crude petroleum vigorous in the Eastern fields: managers of pipelines wanted to utilize the full capacity of their plant, and Pennsylvania-grade crude had qualities which made it particularly attractive to refiners. The interest and depreciation on the investment was a large part of the cost of running a pipeline, and operating costs also were less per barrel when a plant was run to capacity. For refiners in or near the Oil Regions the decline of their supply threatened their advantage in local markets. For even Standard Oil, which enjoyed the Frasch patent, Pennsylvania-grade oil was of prime importance, especially until production of light-gravity petroleum was noticeably increased in other areas in 1905 and later. Some owners of small refineries in the interior of Pennsylvania packed up movable equipment and left for Kansas. Others, and the pipelines which served them, competed sharply with each other and with Standard Oil's affiliates for the declining runs.[9]

Although the methods of Standard Oil's competitors differed from one to another, certain practices were fairly common. Rival buyers solicited business aggressively; "spending money freely," they bought producers' property or took a share in leases, often paying in stock of a pipeline or a local refinery to win continued allegiance. Occasionally the buyers provided producers with drilling equipment or made other concessions. For oil they offered premiums ranging from one to twenty cents a barrel above Standard Oil's posted prices. Sometimes buyers made a long-term contract to assure control of the oil for an extended period. A superintendent in one of Standard Oil's affiliates summed up the problems of himself and others: "We have a great deal with which to contend, owing to the method which is pursued by the other P[ipe] L[ine] Co. to get production from us."[10]

By 1903 competition for the reduced runs had grown very keen. In the monthly, fortnightly, weekly, and sometimes daily, detailed reports from superintendents of the various pipelines affiliated with Standard Oil, O'Day and C. N. Payne read of their rivals' lines connecting with new wells and taking old wells from Standard Oil companies. There were more favorable reports from some of the divisions, but others were critical enough to be read in Room 1400. In Allegany County, New York, National Transit, which had had in December, 1902, a run of 55,000 barrels, 76 per cent of the field, had lost two-fifths of its volume to competitors by the summer of 1903. Even earlier that year Superintendent

John O'Brien had written from Pittsburgh: "I feel we should do something, soon, to protect our plant."[11]

Standard Oil did not fail to act. In July of 1903, after consultation with the Executive Committee, O'Day submitted to Archbold a summary of superintendents' reports with specific suggestions for meeting the situation. By the autumn a campaign to regain business was fully launched. "It is very important indeed that we hold all our pipe line business to the last barrel, and I urge you and all of our employees to work to that end," O'Day wrote to his field men. "It is one of the most important things on hand at the present time in my opinion and we are enlisting the services of every one of our people, whether they are producers, pipe line people, gas people or refiners, to aid us in this direction."[12]

One line of endeavor involving great efforts to reduce costs of operating pipelines and to increase efficiency had commenced earlier in the year. In 1903, on the death of the veteran J. H. Snow, Forrest M. Towl was recalled from his new experiences in California and was appointed general superintendent of the New York and Pennsylvania trunk lines of Jersey Standard's affiliates. Towl and his staff drove to modernize these old pipelines. New mechanical and electrical experts were added to the Engineering Department. At pumping stations Towl's men repaired or replaced boilers, substituted brass water pipes for iron ones, and installed economical flywheel pumps. Natural gas engines were put in at an increasing number of stations, and, where coal was used, coal-handling machinery and favorable large contracts for coal reduced costs. Even though Western Union gave a low rate for such noncommercial business as pipeline reports, W. W. Splane of the Telegraph Department put on a campaign to cut out unnecessary messages.[13]

In some districts National Transit sold its plant to Tide Water to reduce payrolls and overhead. For example, in Bradford County, Pennsylvania, where Standard Oil had only 29 per cent of the runs and that largely of its own production, it sold its business to Tide Water, which already had 57 per cent of the runs. The same policy was followed in Allegany County, New York, in the autumn of 1903.

Other competitive methods were more direct. Standard Oil men resorted to a certain amount of persuasion, usually friendly but sometimes with a veiled threat, in appeals to competitors. "I had a pretty square talk with him and read the riot act in a gentle way to him," Joseph Seep, Standard Oil's crude oil buyer, reported to O'Day regarding his conversation with the president of the West Pittsburgh Refining Company, Cora-

opolis, "I told him that I was aware of him having bought a lot of oil from the Hanover Oil Co. on which he paid 10¢ premium; and while he had a perfect right to do so, yet, I thought he would find he was making a big mistake; that we didn't propose to sit still and let him interfere with our business."[14]

In October, 1903, National Transit reduced its allotments of crude oil to independent refiners, who were thus squeezed in the competitive struggle for running Pennsylvania-grade oil. Within a few weeks some members of the National Petroleum Association, which had been organized in 1902 for a variety of purposes, negotiated a contract with National Transit for 150,000 barrels per month and an agreement to furnish Standard Oil all their refined oils destined for export.

Both Seep and C. N. Payne were "pretty busy" seeing and writing to producers, reminding them that the "Old House" had given them good service over a long period and was willing and able to serve them in many fields.[15] It was a strong talking point for Standard Oil men that their organization had gone early into fields, would lay a pipe a long distance, would take care of oil by providing storage and piping, and was willing to offer producers similar facilities in the new petroleum states in which some of them were already investing. Being trusted for past dependability, however, was not enough.

Several positive measures were taken to hold producers or win them back. O'Day appealed to Standard Oil's production companies to help. He asked that preference be given to drilling contractors who were also producers on their own account, "thereby securing them to us more firmly." W. J. Young was not too enthusiastic about this approach, believing that competing producers would gain much useful information at South Penn's expense, but he agreed that he would endeavor to do everything possible to obtain business "for the general interest."[16] His company and others also bought out recalcitrant producers who were inclined to patronize other pipelines, even though there was more than a faint suspicion at times that a wily producer, eager to sell leases, played one interest against another. Taking over of leases on producing property also discouraged a rival transportation company from entering a new district.

Standard Oil made loans to some producers to retain their allegiance. For twenty-five years such loans had been granted for small amounts through Joseph Seep. Close to the oilmen, he often asked O'Day to consult the "gentlemen upstairs" about encouraging output by helping a man whom he considered "a very decent fellow" or one who had "played in

hard luck" with the drill.[17] The men in Room 1400 usually consented to loans reluctantly, but O'Day made persuasive recommendations. He reminded Rogers that they had never lost a dollar on these debts and advocated a specific loan on two grounds: it was safe and it would serve to protect the pipelines, since payment would be made in petroleum. Late in 1903 Standard Oil made one of its largest loans. An ambitious producer, Theodore N. Barnsdall, failing to get funds either from his friends in Pure Oil or in the New York money market, appealed to O'Day. The latter was surprised at the quick response of top management. From the "pipeline standpoint" this was well, for Standard Oil gained a large producer.[18] It had no patent on the technique, however, for competitors also won producers by financial aid.

As in the case of making loans, competition encouraged Standard Oil managers to deviate from at least two more of their preferred practices. To meet a particular situation the pipeline men were willing to make a threefold division of the royalty interest; two was the usual limit. Although National Transit's contracts with producers provided for a sliding scale of storage charges, increasing with the price of crude, the company's managers did not raise the rate from thirty cents to forty cents per thousand barrels per day as the highest current price of crude in 1903 would have allowed.[19]

At the same time Standard Oil tried to avoid granting privileges which would encourage the producers, in their natural self-interest, to play one purchaser against another. Where a well had been disconnected from a Standard Oil pipeline and the competitor was unable to buy the full output, O'Day refused to take a remnant; as he explained the policy, he did not wish producers to think they could make "a convenience of us."[20] He did not mention the pressure implicit in the action.

The payment of premiums for petroleum caused much discussion. Standard Oil normally paid higher prices for oil of unusual quality needed for special purposes; such was the case in the price paid for Franklin oil rich in lubricants. Sometimes, however, the definition of a district was extended for competitive purposes, a policy not new and frankly admitted by Archbold before the Industrial Commission in 1899. One argument for the payment of a premium price was that in a declining area a higher price encouraged work on wells which produced only one or two barrels per day. Another was that when rivals paid higher prices these had to be met in order to get petroleum.[21]

Standard Oil men usually opposed the payment of a direct premium for

regular crude oil. Unless the quality of petroleum justified a special price, Standard Oil, operating over a wide area, did not wish to discriminate against producers in fields where competition was not present. Such discrimination would be undesirable from the "pipeline standpoint," for it might encourage producers to organize rival transportation companies merely to obtain premiums.

In the spring of 1904, however, competition in the growing field at Scio, New York, made Standard Oil decide to pay "such a price for the oil at the wells" as might "be necessary to obtain it." An affiliate, the Vacuum Oil Company, which needed high-grade petroleum, entered the field as the buyer.[22] One of the bitterest pipeline fights in the history of Allegany County, the location of the Scio pool, then ensued.

Here the usual competitive struggle was enlivened by the aggressiveness of individuals. Pipeline Superintendent O'Brien reported to O'Day that the Standard Oil marketer in the area talked too much to the competitors and kept them "on the offensive." On the other hand, O'Brien characterized W. H. Norton, a large producer who owned stock in the local refinery at Wellsville and in rival gathering and trunk pipelines, as "an old rogue." Certainly Norton wrote lively, unbusinesslike letters to O'Day. They varied from warnings to stay out of the Scio field to a friendly reminder that O'Day belonged to "the same Christian Church" as the managers of Standard Oil's competitor, the Columbia Oil Company at Bayonne, to which Norton had decided to sell some of his crude oil rather than to complete the deal to dispose of his business to Standard Oil.[23]

Perhaps the fact that the editor of the Allegany County *Democrat* was a stockholder in the local Wellsville Refinery had an influence on his choice of adjectives in writing about the conflict between Vacuum Oil and the rival pipeline men. Of Standard Oil's affiliate laying a gathering line after it had been once torn up, he wrote: "Sunday night while the victim of Standard's greed and repeated outrages was sleeping, the hirelings of the soulless monopoly again laid the lines across the property." When Vacuum's pipeline was cut by rival contenders for a right of way, he reported of the latter: "They repaired to the scene of the autocratic outrage and again loosed the tentacles of the commercial octopus."[24]

Though the competitive struggle, both in Scio and in other fields, continued long beyond the end of 1903, by the autumn of that year O'Day could make a much more favorable report to Archbold than during the summer when the drive to regain business had begun. Whereas in July he had had to mention heavy losses of Standard Oil's runs to "outside lines,"

in October and November he could write: "You will notice a very respectable loss in receipts on their part. It would seem as though our active operations for the last two months are beginning to have effect."[25] Standard Oil had indeed hardly started the fight, but O'Day, when he saw his lines getting a smaller percentage of declining business, could throw greater power into the struggle than his competitors.

Undoubtedly, however, this and other fights stirred up ill feeling in the Oil Regions. Lewis Emery, Jr., did not lose the opportunity to make political capital of the struggle in Bradford County, Pennsylvania. The tone of the local press in reporting competitive struggles was hardly judicious.

It should be noted that the chief competitors of Standard Oil remained in business and that some grew in importance. This was not a case of a monopoly crushing out all rivals; it was a lively manifestation of the existence of competition, albeit uneven and rough. As the competition against Standard Oil increased, the accusations that it had a monopoly grew louder.

NATURAL GAS INTERESTS EXPAND

From the nineties, when, as a by-product of the search for petroleum, dry gas in large quantities poured from wells in West Virginia, the managers of Standard Oil faced the need to formulate a policy with regard to their gas interests. Their early start in this business during the 1880's had been followed by sales of most natural gas holdings at the end of the decade, as discussed in Chapter 7. Within a short time, however, drilling for oil resulted in the discovery of plentiful supplies of dry gas for which Standard Oil men sought and developed outlets. Once the markets for gas were established, usually in large consuming centers, continuity of supply became important. Gasmen then turned their attention to purchasing additional producing property, conveniently near the growing cities where obtainable, or from companies which were drawing from the same reserves as Standard Oil. In general, an attempt to balance producing and marketing, linked by adequate pipelines, motivated expansion of the gas business.[26]

Discussion of the participation of Standard Oil in the gas industry is limited here largely to the activity of its affiliates in the Appalachian area and the markets which this region served. For the reader a list of gas companies associated with the combination is provided in Table 35. In addition, men within the combination were interested in the National Fuel Gas Company, successor in 1902 to the Natural Gas Trust. The seven

affiliates of National Fuel produced and marketed in northern Pennsylvania, the eastern part of Ohio, and western New York, including Buffalo.[27] There was no direct legal connection between this group of corporations and the gas companies within Standard Oil, but they had many stockholders in common, and some employees and officers served as links between them. In the first part of the decade John Bushnell was the secretary of National Fuel Gas Company; H. H. Rogers was its president, succeeded in 1907 by another Jersey Standard director, Walter Jennings. A full study of Rogers' business career would throw additional light on the gas industry of the United States.

With all its interests, direct and indirect, Standard Oil's share in the gas industry, which numbered more than two thousand companies, appears not to have been dominant. Although to Standard Oil as a whole its participation in the industry was a side line, to the gasmen within the combination theirs was a function not to be ignored.

The increase in the number of companies, often under the aegis of the National Transit, was the corporate manifestation of the increase in Jersey Standard's investment in natural gas. In 1892 companies associated with Standard Oil held stock in only three gas companies;[28] by 1911 the number was more than twenty. (See Table 35.)

Several factors accounted for the organization or acquisition of new gas companies by Standard Oil throughout the nineties and the first decade of the century. As the affiliates of the combination producing petroleum brought in rich supplies of gas, especially in West Virginia, arrangements had to be made for its piping and marketing. Separate producing companies were established to produce the natural gas.[29] Organization of special corporations to transport and market the product gave rise to additional companies. Special arrangements with businessmen outside Standard Oil sometimes necessitated the creation of additional corporations. Desire to avoid implications of the federal regulation of interstate commerce probably also restricted some companies to state boundaries.

The growth of natural gas interests was accelerated after 1897. In the following year National Transit organized two important new corporations. Hope Natural Gas, the first large producer of natural gas in the Standard Oil combination, took over at cost gas wells of the South Penn Oil Company and The Carter Oil Company in West Virginia. The East Ohio Gas Company was chartered in the same year to produce, transport, and market natural gas in the rapidly growing industrial cities of Ohio.

This company soon needed to import supplies from West Virginia. In 1902 The Connecting Gas Company was organized for the purpose of transporting gas north from the Ohio River to Sugar Grove, Ohio, where it was delivered into the pipes of the East Ohio. O'Day reported in that year that sales of some 39,000,000,000 cubic feet of gas by companies affiliated with Standard Oil totaled $5,273,000.[30]

In 1902 the management of the gas interests within Standard Oil was reorganized. O'Day recommended the change to Rogers, commenting on the fact that the business had "grown enormously" and that, given the increasing population and rising industrialization in the area served, the business could be expected to expand even more rapidly. Plans for improving management of the gas companies are an example of one move to systematize the organization after 1899. The steps taken followed the usual consultative process of Standard Oil. In order to have "everyone contented, as far as possible,"[31] O'Day conferred with all the general managers of the gas companies. The chief features of the reorganization were a statement of the purposes of the advisory group and an increase in the number of men given responsibilities for management, in order that elderly men could carry lighter loads.

The Advisory Board, later referred to as the Natural Gas Committee, had its functions defined, and new men were added to its deliberations. In 1902 its membership included men who had been experienced in the gas business for almost twenty years—Daniel O'Day, C. N. Payne, Elizur Strong, and John Bushnell, the last-named as comptroller of many companies—and two new general managers, Glenn T. Braden and Martin B. Daly.[32] General managers of gas companies presented problems to the Advisory Board, which considered issues in relation to "the general interest" and made recommendations to the Big Board. Another stated purpose of the advisory group was to harmonize the differences of opinion which arose between the natural gas interests and other parts of Standard Oil, especially the producing companies to whom they sold gas for drilling and pumping and with whom they exchanged producing properties.

Braden, one of the new general managers, was with Standard Oil only until 1906, but he was an experienced production man and proved to be an able and aggressive executive in natural gas operations. Earlier he had served as second-in-command to Noah Clark in the South Penn Oil Company. Braden's friendship with Theodore N. Barnsdall, formerly closely associated with the Pure Oil group, was probably one factor which started Standard Oil on a complex relationship with that ambitious producer of

Table 35 NATURAL GAS COMPANIES AFFILIATED WITH STANDARD OIL COMPANY (NEW JERSEY),[a] 1892-1911

	Organized	Held By	Held Date	Per Cent Held[b]		Disposition
California Natural Gas Co.	1910	SONJ	1910-1911	100.00		
Chanute Fuel & Light Co.	1897	Forest	1897-1899	63.90		Sold, 1899
Clarksburg Light and Heat Co.	1904	N.T. Co.	1904-1905	50.00		
		SONJ	1905-1911	51.00		
Commercial Natural Gas Co.	1892	Forest	1892-1900	100.00		Sold to National Fuel Gas Co., 1900
Connecting Gas Co., The	1902	N.T. Co.	1902-1909	49.90		
		SONJ	1909-1911	49.90		
East Ohio Gas Co., The	1898	N. T. Co.	1898-1909	100.00		
		SONJ	1909-1911	100.00		
Flaggy Meadow Gas Co., The	[c]	South Penn	1894-1898	81.25	(1894)	
				100.00	(1895)	
		N. T. Co.	1898-1902	100.00		Liquidated, 1902
Hope Natural Gas Co.	1898	N.T. Co.	1898-1905	100.00		
		SONJ	1905-1911	100.00		
Humboldt Gas Co.	1897	Forest	1897-1902	73.00		Sold
Lawrence Natural Gas Co.	1886	Forest	1892-1902	100.00		Consolidated with Peoples, 1908
Mahoning Gas Fuel Co., The	1886	N.T. Co.	1902-1905	100.00		
		SONJ	1905-1908	100.00		
Monongahela Development Co.	1904	Clarksburg Light and Heat	1904-1911	[c]		
Mountain State Gas Co., The	1892	South Penn	1892-1898	100.00		
		N.T. Co.	1898-1905	100.00		
		SONJ	1905-1910	100.00		Liquidated, 1910

Table 35 (Continued)

	Organized	Held By	Held Date	Per Cent Held[b]		Disposition
New Domain Oil & Gas Co., The	1892	South Penn	1894-1898	50.30	(1894)	
		N.T. Co.	1898-1911	66.60	(1895)	
				100.00	(1896)	
North Western Ohio Natural Gas Co.	1886	1 of 20 Cos.	1892-1899	59.30		In 1909, SONJ held all but qualifying shares. Liquidated 1910.
		SONJ	1899-1910	59.30		
Peoples Natural Gas Co., The	1885	N.T. Co.	1903-1905	100.00		
		SONJ	1905-1911	100.00		
Pittsburgh Natural Gas Co.	1888	N.T. Co.	1903-1905	100.00		Consolidated with Peoples, 1908
		SONJ	1905-1908	100.00		
Prairie Oil & Gas Co., The	1900	N.T. Co.	1900-1911	100.00		
Reserve Gas Co.	1902	N.T. Co.	1902-1905	50.00	(1902)	
		SONJ	1905-1911	50.00	(1905)	
River Gas Co., The	1894	South Penn	1894-1898	52.60		
		N.T. Co.	1898-1905	52.60		
		SONJ	1905-1911	52.60		
Taylorstown Natural Gas Co.	1889	Forest	1892-1902	30.00		
		N.T. Co.	1902-1905	30.00		
		SONJ	1905-1911	30.00		
		Washington	1892-1911	70.00		
United Fuel Gas Co.	1903	SONJ	1910-1911	51.00		

[a] By 1911 Standard Oil Co. (New Jersey) also held shares in The Ohio Fuel Supply Co., the Lone Star Gas Co., and the North Texas Gas Co. In the last two companies mentioned the interest was very small.
[b] In some cases qualifying shares should be deducted from the 100% figure.
[c] Data not ascertained.
Source: SONJ, Corporate Recs. and charters, and Consol. Accts. of S. O. Interests and SONJ, 1892-1911.

gas and petroleum. Braden was president and general manager not only of the Hope Natural Gas Company but of the Reserve Gas Company, a new corporation chartered in 1904 to consolidate and develop the contiguous gas territories owned by the Hope Natural Gas Company and T. N. Barnsdall in Harrison and Lewis counties, West Virginia. National Transit owned one share more than half of Reserve's original capitalization of $1,500,000 and helped to finance Barnsdall in his purchase of the remaining stock. Barnsdall interests (later the Union Natural Gas Corporation) and the Hope Natural Gas Company divided the product of the Reserve Gas Company for their markets.

Standard Oil's affiliates transported only about a third of the gas that was carried out of West Virginia, but associated marketing companies increasingly depended on that source of supply to serve Northern markets.[33] In addition to some affiliated gas companies supplying consumers in West Virginia cities and towns, other corporations were concerned with piping and marketing West Virginia's natural gas in Ohio and in Pennsylvania as supplies there declined.

The most important change in management of a marketing company of natural gas made in 1902 was the promotion of Martin B. Daly. Although the veteran Elizur Strong continued until his death in 1906 to be president of The East Ohio Gas Company, Daly became general manager of both this company and the North Western Ohio Natural Gas Company, in which Jersey Standard directly held 59 per cent or more until 1910. Daly, who had risen from being a gauger and doing other field work, had accumulated great practical experience in producing and piping petroleum and natural gas and in managing various field properties. Hence, he was well qualified to handle the new construction work needed as well as to operate the plant. Moreover, Daly, an amiable man characterized by O'Day as one "of influence and strength as well as of sterling integrity and character,"[34] had the personality to be a successful marketer as well as one of the prominent lay leaders in the Roman Catholic Church. He combined technical experience with the ability to win the confidence of mayors and to have agreeable relations with consumers.

Daly's first big construction task in 1902 was the introduction of natural gas to Cleveland. Already the company was selling in Akron, Canal Dover, Canton, Dennison, Massillon, New Philadelphia, Sharon, and Uhrichsville. To extend its scope, the charter of East Ohio Gas was amended to include Cuyahoga County; to keep up with technical developments, the reference to "wrought iron pipe" in the description of transportation rights was

changed to "iron or steel pipes." In the city the reform mayor, Tom L. Johnson, gave the company in O'Day's opinion "fair though severe treatment."[35] To reach the market an eighteen-inch pipe was constructed to carry West Virginia gas from Sugar Grove. Before completing this line and providing consumers with gas, the pipeline men faced many problems. They had to get rights of way from 272 people and overcome the hindrances of bad roads. defects in some castings and couplings, lack of skilled laborers (especially gas fitters), delay caused by a landslide in West Virginia, and an incendiary fire. The fire shut off gas in Akron on a winter's day, thus providing fuel for opposition from coal dealers and competing artificial gas companies.

In spite of the usual problems of the business, the progress of The East Ohio Gas Company in Cleveland, as in other marketing centers, was excellent. Natural gas reached Cleveland the first week in January, 1903, just six months after the acceptance of the ordinance to supply natural gas there for fuel and heating purposes. Many domestic consumers made applications for meters, and Daly signed contracts to supply large quantities of gas to the American Steel and Wire Company, Pabst Brewing Company, and other manufacturers to the number of more than 280 within two years. By that time thirty thousand domestic consumers were supplied with natural gas, and the trunk-line capacity had been increased. A break in the line in the severe winter of 1904 gave rise to newspaper headlines, "People Shivered in Their Homes,"[36] and the appointment of a committee of the City Council. New work in West Virginia that year was delayed by threatened legislation which would have severely restricted the "export" of gas from the state. These were merely some of the vicissitudes of the business, which on the whole made successful progress.

The gasmen found that the Big Board was not always quickly in sympathy with suggestions for expansion. In 1903, with increasing production, the managers of gas interests advised the purchase of marketing companies in Pennsylvania. O'Day informed Payne, who was one of the strong advocates of finding new outlets for gas, that when the recommendation to buy The Peoples Natural Gas Company was discussed in "the Executive Committee room," the members of top management seemed "to be all mixed up on the natural gas business" and "soured on it." Pratt was very much opposed to expansion. O'Day's opinion was that Rogers did not openly support the move because he was "simply sparring for the purpose of bringing some of the others to his way of thinking." Archbold was strongly in favor of acquiring the marketing company but did not like to

urge the step because gas business was "beyond his department,"[37] his special function being the production of crude oil.

Within a few months the Board had approved an increase in the number of marketing companies, although it continued to keep a restraining hand on the expansion. National Transit purchased The Peoples Natural Gas Company for some $4,483,000. C. N. Payne became president; his son, Christy Payne, secretary; and John G. Pew started his association with Standard Oil gas business as assistant manager. The Pittsburgh Natural Gas Company, which sold to mills and factories, was also acquired by National Transit. From time to time, however, top management continued to be restive about the expenditures on the gas companies, especially at the tendency of the managers to make plans for expansion without previous proper approval of appropriations at 26 Broadway.

Rate-making was a controversial question on which the gasmen did not always make unanimous recommendations to Rogers. O'Day and Bushnell thought gas prices too low at the beginning of the century. Payne and Strong were among those who unsuccessfully resisted the increased rates in some areas. Local ordinances set a maximum. Bushnell's carefully prepared reports on cost served as the basis for discussions. His auditors "scrutinized in detail and with critical analysis" the books of the gas companies of which he was comptroller, and to their reports the judgment of the Depreciation Committee was added. It was not easy to ascertain the real cost of natural gas, especially since searching for petroleum accounted for some joint costs. Other considerations were the "intrinsic worth" to the consumer, the prices of competing sources of light, heat, and energy, and whether the time for a change was "politic" in view of recent declarations of dividends, the coldness of the winter, and the general state of public opinion.[38]

Various consumers and competitors, both in and outside Standard Oil, presented conflicting points of view. When the managers of the natural gas companies recommended raising the flat daily rate for gas used in drilling a petroleum well and the monthly rate for pumping it, the producing companies within Standard Oil were heard from in no uncertain terms. Although "domestic consumers"—that is, homes—were termed the "staying feature of the business," specially low rates were given to attract manufacturers, a fact which raised protest from C. W. Owston, who was confronted with the problem of marketing an increasing volume of industrial fuel oil for Standard Oil after 1901.[39]

Rates for domestic consumers varied from region to region and over

the decade. Gradually they were standardized within a sizable area. In 1905 rates per thousand cubic feet ranged from twenty cents in West Virginia, the area nearest the rich gas-producing properties, to thirty-five cents in Toledo. Cleveland enjoyed gas for thirty cents. No minimum monthly charge was made, at least until 1905, although increasing efforts were made to get all consumers on meters. Discounts were allowed for prompt payment, and in some towns long-term contracts were made with consumers to guarantee a steady price. City buildings and charitable institutions were usually given reduced rates, but on advice of lawyers no difference was made between small and large domestic consumers.

There were two organizational changes in the gas companies in the second half of the decade. Starting in 1905, the shares in some dozen corporations were transferred from National Transit to the Standard Oil Company (New Jersey). This was in keeping with the general move to make associated companies direct affiliates of Jersey Standard and might have been motivated by the current federal investigation. The second development was the consolidation of companies. The latter step both reduced the number of separate companies held by Standard Oil and brought in some outside interests. In 1908 The Peoples Natural Gas Company, the Pittsburgh Natural Gas Company, and the Lawrence Natural Gas Company, all affiliates of Jersey Standard, were merged under the title of the first-named. All these corporations now lacked adequate supplies of their own and depended to some extent on West Virginia. As O'Day had suggested five years earlier, there were too many gas companies. Each required some extra work, and consolidation was preferable where, as in the case of Peoples and Pittsburgh, the directors were the same and the public knew it and no definite legal reason existed for the uneconomical existence of separate companies.[40] In February, 1910, the capital of The East Ohio Gas Company was increased to $20,000,000 and the company was reorganized to include two artificial gas companies, The Cleveland Gas Light & Coke Company and The Peoples Gas Light Company.

After 1906 a number of men assumed new or greater responsibility for managing gas companies. In that year O'Day died, and C. N. Payne, who for many years had been a key man, was given new titles as president or vice-president of several companies and was called to New York to become chairman of the Natural Gas Committee.[41] Two years later A. C. Bedford was elected president of several corporations, and he played a more sig-

nificant role on the Big Board for this part of the industry after the death of Rogers in 1909.

By the close of the decade, the advantage of holding large gas properties took on a new significance. The value of gas reserves increased not only because of the growing demand for fuel, but also because economical methods had been discovered to recover the gasoline contained in natural gas. As early as 1906 George Saybolt and Roger Chew of the Jersey Standard began to conduct experimental work at the plant of the Hope Natural Gas Company's property at Hastings, West Virginia. Saybolt took out patents to cover his absorption process. Although the Hope Natural Gas did not construct a commercial plant for the purpose before 1913, other companies in the United States, including The Carter Oil Company, had increased their output of gasoline from natural gas to sizable proportions by 1911.[42] This recovery of gasoline from natural gas by Saybolt and others supplemented methods used in Standard Oil refineries for extracting gasoline from petroleum gases since about 1895.

The history of Standard Oil's natural gas interests illustrates several developments within the organization. The plan to improve management in 1902 was one example of the effort to systematize the organization after Jersey Standard had become the parent company. While the Big Board made the final decisions on such matters as appropriations, the policy of growth in this area of operations was strongly urged by the officers of the gas companies themselves. Instead of following an over-all policy, the Natural Gas Committee appears to have made recommendations to meet ever-recurring new situations. New wells came in and gas gushed forth; companies were organized to handle and pipe the raw material. Then there was a reason for expanding marketing facilities. Some marketing firms with dwindling supplies either saw the advantage of combining with a large producer or were approached by gasmen looking for an outlet for their product. The Big Board was persuaded to take the point of view of the experienced gasmen, who for decades had had enthusiasm for piping. The business grew and new dynamic managers were added, who expanded the business still further. When original purposes for separate corporations disappeared, consolidations were considered economical. In the ten years 1898 to 1908 the affiliated companies sold 285 billion cubic feet of natural gas, receiving some $34,000,000, or an average of about twelve cents per thousand cubic feet. That average points up the fact that, while Standard Oil had investments in some marketing companies, a considerable quantity of its natural gas was sold at wholesale

to other marketers. Its share of the market was approximately one-eighth.[43]

THE SOUTHWEST

While making profitable adjustments to declining petroleum production in some areas and dramatic changes in natural gas operations, Standard Oil officials found themselves involved in another confusing and perplexing situation in the Southwest. They had already been committed to producing, purchasing, and piping Corsicana and Kansas oil prior to 1900. Now they had to decide what measures to take when in 1901 the Spindletop well created a boom on the Gulf Coast of Texas and when oil later began to flow in even greater amounts in Indian Territory. Spread of the producing area, the increase in the supply of asphaltic crudes, expanding demand for gasoline, restrictive federal and state laws, spectacular rise of competitors, and a host of other circumstances influenced the nature and course of Standard Oil policy in Kansas, Indian Territory, Louisiana, and Texas.

Standard Oil executives participated only indirectly and to a limited extent in the early petroleum developments of Texas. In producing and piping, as in refining, the partnership of H. C. Folger, Jr., and C. N. Payne, with the aid of National Transit funds, carried on operations, exclusive of marketing, in the eastern section of the Lone Star State. Throughout the years from 1899 to 1909 the two men operated and at times owned the Corsicana Refining Company (later known as the Navarro Refining Company), which also owned a short pipeline and had an interest in a producing firm. The Security Oil Company, financed by a London corporation with capital invested by the Anglo-American Oil Company on loan from New York Standard, began operating a refinery at Chaison, two miles south of Beaumont, in May, 1903, and built crude oil pipelines to the Humble, Dayton, Batson, and Sour Lake fields as well as a product line to Sabine. After liquidation of the Texas companies by court order in 1909, their properties were absorbed into the Magnolia Petroleum Company two years later. Security never produced any oil, and available evidence (see Table 34) indicates that Corsicana's production dwindled as the flow in eastern Texas declined, in spite of attempts by managers to increase the output.[44]

Undoubtedly more significant was Jersey Standard's activity as a buyer of Texas crude. Starting in 1901, when the tanker *Atlas* carried the first

experimental cargo of Beaumont oil to Atlantic Coast refineries, Standard Oil became one of the largest buyers of crude oil on the Gulf Coast.[45]

Two considerations undoubtedly explained Standard Oil's lack of greater activity in Texas. In the first place, the legal climate was distinctly unfriendly, as the litigation against Waters-Pierce and legal attacks on the Security and Corsicana companies, related elsewhere in this volume, amply demonstrate. Secondly, although the later tremendous development of petroleum in Texas gives historic significance to the flow from Spindletop, it must be remembered that during the first decade of the twentieth century fields in other states promised more. Even in 1905, Texas' boom year for the decade, when production in the state rose above 28,000,000 barrels, it was outranked by California. Texas production dropped more than 65 per cent the next year and continued to decline steadily to 1911, when it was exceeded by output not only in California but also in Oklahoma, Illinois, Louisiana, and West Virginia.[46] Small wonder that Gulf Coast refiners built pipelines to Oklahoma to obtain crude petroleum for their plants in this period.

More important than any other factor explaining Standard Oil's relatively slight interest in Texas was the overwhelmingly greater attractiveness of activity in Mid-Continent petroleum. That crude oil yielded a higher percentage of kerosene and gasoline, the products in which Standard Oil operations centered, than Texas crude; and the total flow of petroleum from Oklahoma proved both greater and steadier than that from the Beaumont area. Furthermore, Archbold and his associates had a good beginning in Kansas. Forest Oil was already active in production, and Kansas Standard continued to operate the refinery at Neodesha.

Since the charters of neither of these two companies provided a satisfactory basis for expansion in Kansas, Standard Oil executives in 1900 organized a new corporation in that state to produce, buy, store, and pipe petroleum. This new organization, known at first as the Kansas Oil & Gas Company, acquired the property of Forest Oil in 1901. A year later, to avoid confusion with a West Virginia company bearing a similar title, the new corporation's name was legally changed to The Prairie Oil & Gas Company. It entered into a race with the increasingly fast flow of oil from the Mid-Continent area by laying gathering lines, erecting storage tanks, and filling them to capacity. It qualified to do business in Missouri, Iowa, Illinois, Indiana, Indian Territory, and Arkansas, and built trunk lines through which it ran only crude which it had produced or purchased itself to supply old and new Standard Oil refineries.[47]

Changes in capitalization and indebtedness mirrored the dramatic increase in the activity of Prairie Oil & Gas. As purchasing of crude and construction of pipelines proceeded, Prairie's authorized capitalization grew in a series of raises from $300,000 in 1900 to $20,000,000 seven years later. These moves were in part occasioned by a Kansas law which restricted a corporation's indebtedness to the amount of the stock issued. The company paid no dividends after a 12 per cent one in 1901, reinvested all profits, borrowed extensively from National Transit (usually by book credits), and by 1909 had a bonded indebtedness of $15,000,000.[48]

These alterations were voted by a few officers who, acting as beneficiaries of the National Transit Company, held all the stock of Prairie Oil & Gas. The arrangement constituted the effort made to observe pertinent state antitrust laws and to keep the Kansas corporation legally separate from Standard Oil connection. Actually it was economically an affiliate of National Transit and hence indirectly of Jersey Standard. Although legally all decisions were voted by Prairie's own stockholders and directors, they operated in "the general interest" evaluated at 26 Broadway and expressed in "suggestions" directly to the responsible managers.[49] The situation was well understood by the presidents of Prairie—W. J. Young to 1906 and John F. Archbold, son of John D. Archbold—and by its successive vice-presidential general managers, O. A. Evans and J. E. O'Neill.

Prairie Oil and the other producing companies gradually shifted their major attention from Kansas to Indian Territory. Though the flow of petroleum in Kansas did not decline until after 1906, more of the yield was heavy oil primarily useful for industrial fuel. Faced with a slow market and the collapse of a speculative spree, many Kansans blamed the chief buyer of oil—Prairie Oil & Gas—and had no difficulty in stirring up a voting public already strongly opposed to trusts, Standard Oil in particular. Beginning in 1902, many other seekers of oil, including some with a record of success in fields farther east—Michael Cudahy, Guffey & Galey, T. N. Barnsdall, Joseph C. Trees, and the Benedum brothers—directed their drills into the more rewarding sands of Indian Territory. Within a year Prairie Oil also turned its main efforts there. By 1909 the new state of Oklahoma boasted a total of 1,250 producers.[50]

Leasing potential producing lands in Indian Territory proved to be fraught with difficulty. In 1896 one Edwin B. Foster leased for ten years all the Osage Nation's 1,500,000 acres for a royalty of one-tenth of all oil produced. Subsequent subleases led to much litigation and many investigations. In 1905 Congress renewed the subleases under the Foster grant

stipulating a royalty of one-eighth. For lands of other tribes the Curtis Act of 1898 and ensuing laws, plus administrative rules of the Interior Department, created an ever-changing situation. As applied in the Cherokee Nation in 1902, leasing rights were limited to fifteen years. A lessor was required to make advance payments according to acreage and to pay total royalties not to be less than 10 per cent of the average value of the oil produced each month. He must observe rules about capping abandoned wells and not drilling within 150 feet of division lines, drill a well on each lease within one year, operate it to "the fullest extent" possible, and confine his operations in the nation to a maximum of 4,800 acres. Lack of provision for surrendering unproductive lands practically invited litigation until changes were made. The producing company often seemed unable to please anybody; for example, under an Interior Department regulation of 1904 Indian agents refused to accept advance royalties before approval of leases by the Secretary of the Interior, while many Indians, eager for cash, insisted upon payment. Two years after a congressional investigation in 1906, uniform regulations were established for the Five Civilized Tribes.[51]

Because of both legal limitations and deliberate policy, Prairie Oil & Gas produced a relatively small proportion of the Mid-Continent petroleum extracted during the years under review. It shared in the yield of the Cleveland, Oklahoma, and Glenn Pool areas. Its first reported net annual production in Indian Territory, that in 1905, amounted to only 101,000 barrels, but its volume rose to 5,230,000 six years later. In Kansas, Prairie's best year was 1904, when its net crude oil production was 116,000 barrels. All told, however, its gross production accounted for less than 6 per cent of the aggregate in Kansas and Oklahoma during the years 1900-1911.[52]

Indirectly Jersey Standard closely associated itself with production in Indian Territory by a large loan to T. N. Barnsdall. Whether to safeguard earlier extensive advances to this expansive producer or to increase deliveries to Prairie's pipelines, or both, in February, 1906, W. J. Young and Barnsdall concluded an involved transaction. The former left the employ of Prairie to manage the Barnsdall Oil Company in Oklahoma, at the same time lending his employer $7,500,000 backed by collateral of gas-company securities. Young received the money from Rogers, Archbold, and Moffett, who in turn received it from the parent company. Some years later M. F. Elliott could recall no reason for the circuitous arrangement, but to counsel whom he himself had retained he asserted that the relationship was strictly that of debtor and creditor. Since the transaction caused official questioning and suspicion on several occasions, it seems obvious that in-

direction in this instance was unsound business policy. As a counterbalance, it must be observed that production in the Osage Nation was stimulated and that Prairie piped the oil.[53]

By all odds, Prairie's chief contribution to the development of the petroleum industry of Kansas and Oklahoma was as a buyer of crude, a builder of storage tanks, and a constructor of pipelines. In carrying out these functions it had important decisions to make and perplexing operational problems to overcome.

The Prairie Oil & Gas Company's method of purchase and transportation differed from that in the Eastern fields. Even before the Kansas common carrier act of 1905 and the federal Hepburn Act of 1906, which applied the Interstate Commerce Act to pipelines, Prairie had taken every precaution not to qualify as a common carrier. It did not have the right of eminent domain; it never used the word "piping" in any contract; it ran only the oil it bought; and it took possession of the oil when it entered its plant. The producer could select the company's posted price for any day within two months of the acceptance of his oil; otherwise he had to take the price of the first business day thereafter.[54]

Among the measures adopted by Prairie's managers to influence the flow and price of petroleum were changes in the classification of the product. In Kansas, Prairie first named three grades, roughly on the basis of gravity, with prices scaled accordingly. After November 10, 1904, however, Mid-Continent oil was purchased by gravity valuation, each tank being tested for specific gravity. All oil above 32° Baumé received a given price; and for each half-degree below this, a reduction of 5 cents per barrel was made, down to 28° Baumé. Oil from 28° to 22° Baumé received a price one cent less than that for 28° Baumé. There was no compulsion, as in the case of a banker of petroleum and a common carrier like National Transit, to hold oil of the different grades equal to the credit balances; hence the price could be adjusted more exactly to gravity. As indicated in Chapter 11, the pipeline men objected to the new technique of classification but were overruled. Although the new departure resulted in an intensification of criticism of Standard Oil in Kansas, not until June 30, 1909, was a simpler system introduced. Petroleum was then classified into two categories, that 32° gravity and above, which accounted for most of the crude oil, and that below 32°.[55]

Other changes in purchasing techniques of Prairie reflected the shifting relationship between production of crude and available storage capacity. At first the company bought all the oil offered at the market price, but

production of petroleum soon outran its facilities. From March to June, 1905, it took no oil under 30° Baumé. In Oklahoma, Prairie later prorated its purchases among producers according to the ratio of the production of each to storage and pipeline facilities.

Archbold's testimony in 1908, substantiated by evidence in the O'Day letters, provided the fullest statement found concerning Standard Oil's price policy. In 1895 Standard Oil had announced its new plan to post prices and promised that the prices paid would be as high as the markets of the world would justify. Certainly among the facts taken into consideration in announcing prices were the daily information on supply and demand for crude, the availability of a particular field to current markets, the cost of lengthy storage, and careful judgment of the various products to be yielded by the different types and grades of crude. The degree of foreign competition, according to Archbold, played an important role in decisions on price: "We find currently at what price we can sell the finished products in the markets of the world, and that is a feature entering our consideration of the price we can pay for crude oil here."[56] The cost of production and the rate of flow were also taken into account. In the case of Pennsylvania-grade crude, the refiners wished to stimulate its production. Changes in price of crudes were at times motivated by a desire to increase wildcatting and drilling in periods of comparative scarcity and to slow down overactive drilling when construction of storage and pipelines could not keep abreast of a new flow.

The contrast between the scarcity of American oil in 1903 and the tremendous flow five years later was great. Archbold testified: "The Mid-Continent field is producing a quantity of oil that it is impossible to market, and it must, therefore, seek a level at which some new use can be found for it, such as fuel, if you please, or where people are willing to invest capital in its storage, involving the purchase of land, the erection of tanks, and the care of oil for an indefinite period. . . ."[57]

Prairie Oil's policies reflected adjustment to the flood of petroleum from the Mid-Continent fields. As a purchaser of oil and supplier of pipeline services the Standard Oil unit engaged in a race with production comparable to that of the Bradford field between 1877 and 1882. At one and the same time, through Prairie Oil & Gas, Standard Oil officials sought to buy as much oil as possible in order to keep producers satisfied and thus to discourage the rise of competition, to transport large amounts of Oklahoma crude to old and new refineries, and to erect storage tanks for the

oil bought in excess of the current demand.[58] To achieve these objectives the pipeline men labored tirelessly from 1900 to 1911.

To care for the oil produced, managers of Prairie Oil adopted many expedients and performed many feats of building that were prodigious for the time. Thwarted in all early attempts through the legal staffs of both 26 Broadway and Prairie to secure approval from the Secretary of the Interior for right of way for pipelines in Indian Territory, Standard Oil men had to wait, as did others, for Congress to pass a permissive act early in 1904. Having used tank cars to carry the oil from Oklahoma to Kansas until pipelines could be laid, field men had shortened the rail haul by building a trunk line from Neodesha to Caney in 1903. As soon as the signal came from Washington, gathering lines were built in Indian Territory and a connection established with Caney. By the summer of 1904 oil from Bartlesville was being pumped to the Neodesha Refinery. During the next two years pipeline men made connections with the Cleveland, Glenn Pool, and neighboring districts, and laid parallel pipes to increase the capacity of trunk lines.[59]

Simultaneously pipeline men created storage capacity at an increasing rate. They imported cut-down tankage from Pennsylvania, Ohio, Indiana, and Corsicana, and bought new punched and fitted steel plates from various suppliers. Prairie's managers directed teams of builders who constructed tanks, ranging from 26,000 to 55,000 barrels in capacity, at Caney, Humboldt, Neodesha, Independence, Chanute, and Thayer in Kansas, and at Bartlesville, Red Fork, Muskogee, Cleveland, Ramona, and other points south to Okmulgee County in Indian Territory. Tank capacity grew at the average rate of 10,000 barrels a day in 1903, 18,000 in 1905, and for a time during that summer at 35,000 barrels a day. The gush of oil from Glenn Pool a year later rendered even that pace quite inadequate.[60] "The oil producers seem determined to flood the country with crude oil regardless of how it is to be cared for and of its price," wrote O'Day to Michael Cudahy in April, 1905. "It is hard to account for this disposition on their part, as in every other line of business the law of supply and demand prevails and an overproduction must be regulated."[61]

In the meantime, to aid in providing a market for Mid-Continent crude, Prairie Oil's men built trunk lines at a great pace for the time. By October 20, 1904, oil reached Indiana Standard's new refinery near Kansas City at Sugar Creek, Missouri. During the preceding month, following two days of careful deliberation, the men in Room 1400 formulated the "general plan" to build a trunk pipeline from Kansas City to Whiting.[62] After

seemingly out-of-the-ordinary difficulties in acquiring rights of way and in making the best use of new Italian, Austrian, and Eastern European labor, Forrest M. Towl completed the 460 miles of eight-inch line about a year later.[63] By way of comparison, in 1905, also, the pipeline from Baku to Batum in Russia was finally constructed; it was over mountainous terrain and about 560 miles in length, but it had been considered in 1882 and started in 1897.

In commenting upon the completion of the American line, *The Petroleum Review* correctly predicted "the dawn of a new era in connection with the Kansas and Indian Territory petroleum industry."[64] To enhance and facilitate the movement of oil, Prairie Oil & Gas built a second trunk line, from Humboldt to Griffith, Indiana, during 1906. Throughout half its length the new line boasted the first twelve-inch pipe used for such a purpose. With loops, pumps, and relay stations the system could handle fifty thousand barrels every twenty-four hours. The pipeline men repaired and enlarged the trunk-line facilities east of Whiting, and crude petroleum from the new fields flowed to Lima, Cleveland, Olean, and the Atlantic Coast refineries.[65] O'Day died in September, 1906, but his many years of pipeline management had culminated in the creation of the longest pipeline in the world at the time—Glenn Pool to the Atlantic Coast.

In spite of all the efforts of Prairie Oil and others to take care of Mid-Continent production, the situation was actually never in hand. The flow from wells in Indian Territory, which had yielded only 1,367,000 barrels in 1904, mounted suddenly by 1907, and two years later reached 47,859,000 barrels. Even with Prairie's connection with Eastern refineries and the completion in 1907 of two trunk lines south to Humble and Port Arthur by The Texas Company and the Gulf Pipe Line Company, only two-thirds of the approximate 150,000 barrels produced daily were being taken by the pipelines in 1909. Wooden and earthen storage provided but temporary and unsatisfactory means of holding field stocks of high-gravity petroleum. Wells were not shut in for fear they would not flow again; this fact caused waste where facilities for taking petroleum were inadequate or lacking. Attempts by producers' associations to suspend drilling and proposals for a general shutdown proved unavailing.[66] As J. E. O'Neill expressed the problem of handling production: "We thought a number of times we were abreast of it and some new development would put us out again."[67]

By 1909 Standard Oil men found themselves in a perplexing predicament in the Mid-Continent area. In Oklahoma, Prairie Oil had 43,000,000

barrels of oil in storage—almost equal to the total production two years earlier. For three and a half years it had paid forty-one cents per barrel for petroleum of 32° gravity and above, while Gulf and Texas, which usually accepted bids from producers, had made contracts at from twenty-five to thirty-five cents. In 1909 the Texas companies were paying thirty-three and thirty-five cents respectively per barrel for crude of 32° gravity and above. Both rival companies were increasing their pipeline runs and planning to extend their lines north from Glenn Pool. O'Neill declared that competitors enjoyed cheaper transportation by pipe to Gulf ports and tankers to the North than Prairie did by piping all the way to the East. Standard Oil men were faced by the immediate problems of too much oil and at the same time by rising competition and concern for the future of Prairie's plant.[68]

On the basis of ideas from the field and 26 Broadway, several lines of attack were adopted. In June and July, 1909, Prairie made two cuts to compete with Gulf and Texas rates, reducing its offering price from forty-one cents to thirty-five. The fact that the producers for a time had to pay the 10 per cent royalty to Indians on the basis of the former price made the reduction fall more heavily on them. At the same time, partly as a result of representations from Standard Oil men and from producers, the federal government modified the restrictive pipeline regulations of 1906, thus clearing the way for constructing more gathering lines in Oklahoma.[69] Meanwhile, steps were being taken to provide a new market for Mid-Continent crude.

After considering, between 1906 and 1908, the building of a refinery on the Gulf Coast and a trunk pipe to it, Standard Oil executives decided to erect the new plant at Baton Rouge, Louisiana, and to connect it with the Oklahoma fields by a pipeline.[70] In April, 1909, the Standard Oil Company of Louisiana was organized. Under the presidency of Frederick W. Weller, the new company started immediately to build the refinery and to construct a pipeline north to the Arkansas border to meet the eight-inch pipe being laid by Prairie Oil across the latter state.[71] In Oklahoma, partly to cater to ambitions of local politicians, a domestic corporation was created in November, 1909—the Oklahoma Pipe Line Company, with an authorized capital of $2,500,000. Jersey Standard bought all the stock issued except qualifying shares. One of the few Standard lines built by a contractor, the Oklahoma link extended from Drumright to the Arkansas border, where it delivered oil to Prairie pipe. Oklahoma Pipe Line had the right of eminent domain and acted as a common carrier, but it bought

no oil. Prairie performed that function. Before the end of 1910 a new outlet for Mid-Continent oil to the seaboard was available, and price of crude rose in Oklahoma to forty-two cents.[72]

In 1911 The Prairie Oil & Gas Company remained the largest purchaser and transporter of crude petroleum in Oklahoma and Kansas, even if its relative position had declined. Some twenty-five local refineries took increasing amounts, and a few buyers shipped by tank cars, especially heavy oil. Pipelines of the Texas and Gulf companies each took over seven million barrels per annum, an amount which exceeded the total of all other purchasers, excluding Prairie. Standard Oil's great purchaser and carrier no longer had a near-monopoly, but in 1911 it continued to buy approximately three-fifths of the production in Kansas and Oklahoma, to operate large tank farms, and to run a vast network of gathering and trunk lines.[73]

Standard Oil of Louisiana also became a producing company in the Gulf area. The Caddo field had been active since 1905, although it did not then promise to be a major contributor of oil. Near the end of 1909 the wildcatters and early developers of fields, Michael Benedum and Joseph Trees, had their first rich strike in that area, and the wells that followed promised to be "stayers." A Standard Oil branch pipeline was soon connected with this and other production. According to Mike Benedum's memory, managers of Louisiana Standard offered his company ruinously low prices for crude and, when he sold a large part of his production at a higher price, tied up tank cars to prevent delivery of the crude oil sold. By threatening to build a refinery of his own and by asking the President of the United States for aid in getting tank cars from the railroads, Benedum remembers that he was able to get into a good position to drive a satisfactory bargain with Archbold and his fellow executives. In November, 1910, for $6,000,000, Louisiana Standard bought the oil rights, but not those for natural gas, on the properties owned by J. C. Trees & Company. Thus, Louisiana Standard, within two years of its birth, became a fully integrated corporation.[74] It continued to purchase Mid-Continent oil as needed, f.o.b. Ida, Louisiana, but could supply part of its own wants. Jersey Standard had given birth to a vigorous child in its uncertain years.

Not without profit to itself, the Standard Oil organization had made a major contribution to the development of Mid-Continent production. Connection between the vast producing area and refineries east and south had been accomplished by the long miles of pipe laid by The Prairie Oil & Gas Company, the separate Oklahoma company, and Louisiana Standard. Prairie alone had a capital investment, as represented by stock issued at

par and bonded debt, amounting to $33,000,000 in 1911.[75] Total investment of the three units in producing, buying, storing, and piping Mid-Continent petroleum much exceeded the amounts expended by the Standard Oil Trust in developing the Lima-Indiana field between 1886 and 1892. The rapid growth of the industry in both areas illustrates the advantages of a large, self-financed organization.

MIDDLE WESTERN OPERATIONS

During these same years the managers of Standard Oil companies in Ohio, Indiana, and Illinois faced decline of production in the first two states and rapid expansion in Illinois. The output of the Lima-Indiana field was falling: here The Buckeye Pipe Line Company in Ohio and the Indiana Pipe Line Company in the neighboring state encountered the same problems of procurement as transportation corporations in the Appalachians. Simultaneously, Illinois offered a rich field for expansive and dynamic policies on the part of The Ohio Oil Company, the Standard Oil producing and purchasing unit in all three states.

New legislation and the judicial climate undoubtedly played a part in affecting the pattern of developments in Ohio and Indiana. Standard Oil had had many experiences in the courts of Ohio by 1900. The managers of the holding company made every effort to keep the transactions of The Ohio Oil Company legally separate from those of its parent. J. D. Archbold, however, serving as the chief executive of Ohio Oil, provided an important link. J. C. Donnell became the general manager of the company in 1901 and within a few years greatly expanded his corporation, with the financial backing of Jersey Standard.

The Buckeye Pipe Line Company and the Indiana Pipe Line Company met the problems of diminished runs with methods similar to those followed in the Appalachian region. Rivalry increased, and companies struggled after 1902 for a share of declining production in the Lima-Indiana field.

Some of the struggle was fictitious. In 1899 the General Industrial Development Syndicate, Limited, referred to even by the cautious *New York Times* as a "dummy English syndicate," purchased The Manhattan Oil Company.[76] The secret of the syndicate's relationship to Standard Oil appears to have been best kept from the superintendents of The Manhattan Oil Company. D. J. O'Day, operating the Buckeye, reported to his uncle that the supposedly friendly corporation was not only taking wells away from Buckeye but increasing his expenses for pipeline mileage and

steam by disconnecting pipes from all a producer's wells where one was lost. In 1905, a division superintendent of Buckeye complained that the Manhattan and the National Refining Company, aggressively soliciting production near Findlay by offering premiums, both seemed to win wells largely at the expense of his company. The competitive device of relations with a "hidden" company appears to have been unsatisfactory not only from the point of view of public opinion but also from a practical standpoint.[77] Standard Oil later acquired the Manhattan directly and liquidated it.

In the meantime, the record of The Ohio Oil Company from 1899 to 1905 was good but not spectacular. Its net production ranged around 7,500,000 barrels per annum with the exception of one good year in 1901. By 1905 the marked decline of its production in the Lima-Indiana field had begun. (See Table 34.)

In 1911 the company's output from the Indiana and Ohio fields combined was only two million barrels, a drop in keeping with the decline for the states, as their fields were characterized by many abandoned wells.[78] In view of the tremendous effort and expense in developing methods of refining Lima crude and in remodeling several refineries to process it, the short life of these fields might well have been a greater disappointment if neighboring new wells had not already started to produce additional oil, and of high quality.

Discoveries at Casey, Clark County, Illinois, were the signal for a rush to new fields. That state had had a small production since 1886, but no important development until the rich possibility opened in 1904. Not all the able oilmen had gone to the Mid-Continent, and Illinois soon attracted many producers, including The Ohio Oil Company. The developed area spread north and south into the counties of Cumberland, Crawford, Lawrence, Marion, Clinton, and Macoupin. The oil from the northern fields had the evil odor of sulphur, but the petroleum came from shallow wells requiring only four to seven hundred feet of drilling. In the south the wells were deeper, but the oil contained little sulphur. New methods of completing wells kept out water, and initial production was good.

According to contemporary reports, the development of the Illinois field was done in a businesslike manner. In addition to the royalty of one-eighth, bonuses paid to landowners ran as high as $150 and $200 an acre for undeveloped territory acquired directly by producers. The Illinois area spawned practically none of the inexperienced "stock-peddling" companies, which produced in some other states more stockholders than pe-

troleum.[79] By 1907 Illinois ranked third among the oil-producing states of the Union for the year, exceeded by only Oklahoma and California, and in that position it stayed throughout the remainder of this period.

While in all other oil-producing sections Standard Oil units accounted for only a small part of the output, The Ohio Oil Company was a leading producer. With the exception of a few years in the late nineties, when Standard Oil had improved its relative position in the Appalachian area, it never accounted anywhere, before 1911, for so large a percentage of the total produced as it did in the Lima-Indiana field and in that of Illinois. In the latter state, for the years 1905-1911, The Ohio Oil Company produced 37 per cent of the output.

In 1911 The Ohio Oil Company was by far the largest producer in the Standard Oil family. That year it accounted for 15,254,000 barrels of net oil out of Standard Oil's net production of 30,370,000. Its output was almost three times as great as that of Prairie Oil, its nearest contender in the group.[80]

The legal question of which pipeline company should go into the Illinois field was a subject of considerable deliberation before a decision was reached. Buckeye transported in Ohio, and Indiana Pipe Line Company in Indiana; but could the latter do business in Illinois? Pressed by appeals from producers early in 1905, pipeline men were apologizing for their unaccustomed slowness in giving assurance of quick service. They were eager for action, but O'Day wrote to his restive nephew, D. J. O'Day, that Elliott had informed him that the pipeline interests had no authority to gather oil in Illinois, although Prairie Oil was building a trunk line in the state at the time. The year 1905 was an active one in court for Standard Oil companies, and, where more than one of the affiliates had the right to exercise a function in a state and some did not carry on all functions authorized, they might well be accused of collusion. Early in 1905 the men in Room 1400 decided that Standard Oil Company (Indiana), with the nearest refineries and the right to operate in Illinois, was the logical choice to build lines in the state and to buy and run the oil.[81] Some new, and now unknown, considerations apparently came to the attention of the managers of Standard Oil, for The Ohio Oil Company was the affiliate which actually undertook the new function.

Under Donnell that company built an efficient system of gathering and trunk lines. On advice from Elliott, Donnell chose employees who were not also on the payroll of Buckeye and he put the pipelines directly under his own charge. Tank farms were constructed to store oil, and the small

gathering lines that had been built to railroads by other producers were purchased. By 1906 an efficient system of gathering lines was serving Casey, Stoy, and Bridgeport and, taking advantage of the slope of streams, ran crude by gravity to Martinsville substation. In the following year pipelines carried oil to the new refinery built by Indiana Standard at Wood River, near Alton, Illinois. The gathering lines were extended, and a trunk line was built that ran to the Pennsylvania state line near Negley, Ohio. For the three years, 1908-1910, Ohio Oil piped an average of about 29,000,000 barrels per year, all produced or bought by itself, as its charter stipulated.[82]

So large a flow of petroleum, coming at the same time as the rapid increase in the Mid-Continent field, called for both greater refinery capacity and a new outlet to water transportation. The Hepburn Amendment of 1906, which applied the Interstate Commerce Act to pipelines, had an effect on the organization adopted in the East. In 1907, Jersey Standard started to construct a large refinery at Bayway. In the following year a new pipeline, named after A. C. Bedford, was completed over rolling hills and mountains from near Negley, Ohio, to Centerbridge, Pennsylvania. The new line served as a link in the chain that included the system of The Ohio Oil Company at one end and the plant of the Standard Oil Company (New Jersey) at the other. The latter also owned the line that ran from Centerbridge, Pennsylvania, to Claremont and Bayonne, New Jersey. The National Transit had constructed it in 1897, enlarged its capacity in 1905, and then in November of the same year transferred the line to the company chartered in the state through which it ran.[83]

Other changes were made later in the Pennsylvania and New Jersey sections of this important system; some were to enlarge its capacity, and others appear to have been made for legal reasons. In 1909, the Standard Oil Company (New Jersey) increased the capacity of its end of the chain and connected it with the newly completed refinery at Bayway. The following year, consideration was given to the possibility of The Atlantic Refining Company's purchasing the Bedford line, which had a branch running from near Negley, Ohio, to connect with the South-West Pennsylvania Pipe Lines at Cooks Ferry. This action was not taken, but in May of that year, to purchase the property of the A. C. Bedford pipeline, Tuscarora Oil Company, Limited, was organized as a partnership under a Pennsylvania act of 1874.[84] From the date of the completion and enlargement of this pipeline system, an increasing flow of Illinois oil reached Eastern refineries, including Bayonne and the new Bayway.

During the first decade of the twentieth century Standard Oil companies played a leading role in the most remarkable growth of the petroleum industry yet achieved in the United States. While facing contraction and sharpened competition in the waning Appalachian and Lima-Indiana areas, Standard Oil producers applied their skills in Illinois, Kansas, Oklahoma, Louisiana, Texas, and California, the last-named state being the subject of the preceding chapter. Since other areas were more attractive either because of location, nature of the raw material, or legal climate, Texas received relatively slight attention from Standard Oil.

Table 36 NET PRODUCTION OF AFFILIATES OF STANDARD OIL COMPANY (NEW JERSEY) AS PERCENTAGE OF TOTAL GROSS CRUDE OIL PRODUCTION IN THE UNITED STATES, 1898-1911

Year	*Percentage*
1898[a]	33.5
1899[a]	31.7
1900	31.3
1901	27.1
1902	20.1
1903	17.3
1904	14.5
1905	11.3
1906	11.3
1907	11.2
1908	11.3
1909	11.6
1910	13.3
1911	13.8

[a] The percentages for 1898 and 1899 are for Standard Oil Interests.
Source: SONJ, collection of predissolution data.

The net production of the organization as a whole rose from 18,080,000 barrels in 1899 to 30,370,000 in 1911, but its share of the total of the industry declined from 31.7 per cent in the first year to 13.8 per cent in the later year. (See Table 36.) Standard Oil's gross production, assuming a royalty of one-eighth to landowners, declined from its highest relative position of over 38 per cent of the total in the United States in 1898 to about 15 per cent in 1911. Though its volume of production increased 68 per cent in the decade, the combination failed utterly to keep pace with the growth of the industry. Standard Oil's record in buying, piping, and storing petroleum in the country as a whole was more significant than

that in producing. Pipeline builders had increased Standard Oil's trunk mileage from 3,905 in 1899 to 9,389 in 1908, while expanding the great cobwebs of gathering lines from 10,749 miles in the first year to 45,228 in the second.[85] Additions were made to both by 1911. Yet Standard Oil's pipelines were insignificant in Texas, and the combination had been unable to hold its near-monopoly in the Mid-Continent field. The geographical spread of producing fields was too great, profits were too attractive, and competition was too strong for even such a powerful combination as Jersey Standard to keep pace with the expansion of the industry.

Chapter 14

Growth in Manufacturing, 1899–1911

IN COMPANY with everybody else in the industry, Standard Oil manufacturers had to make extraordinary adjustments during the years from 1899 to 1911. Being situated between changing sources of supply and rapidly altering demands from distributors, refiners found themselves in the uneasy middle even more than usual. The emergence of the California, Mid-Continent, Illinois, and Gulf regions as important producers of petroleum posed the question of the location of new refineries with reference to existing markets. Pennsylvania-grade crude was the best in the United States, and especially so for lubricants, but it was in dwindling supply, thus commanding a relatively high price. While pondering these facts and deciding what to do about them, refiners were faced with a spectacular expansion in the market for gasoline, coupled with only a gradual increase in the total world demand for kerosene. Obviously, if greater supplies of gasoline were manufactured by prevailing methods, the increased volume of illuminating oil would depress prices to less remunerative levels. The situation called for basic research and fundamental modifications of existing technology.

Meanwhile, the new crudes and the wide geographical spread of the fields stimulated the erection of competing refineries. They turned out not only kerosene and gasoline but also fuel oil, asphalt, and other petroleum derivatives. Every refining unit in the country participated in the competitive scramble, and many individuals contributed to the ideas and processes upon which the modern petroleum industry was based after 1911.

A host of questions immediately occur to the historian. What general measures were adopted by Standard Oil in response to expanding demand and to shifting sources of supply? Did it build new refineries? If so, where and why? Which old refineries did it expand? Why those particular ones? Which plants declined in relative capacity and activity? Did the combination continue to buy up and dismantle competing plants? What measures did Standard Oil executives adopt to adjust to the changes in the markets

for kerosene, gasoline, fuel oil, and other products? Did they adopt a systematic research program? Did Standard Oil keep pace with competitors in all manufacturing phases of the industry in the United States during these years?

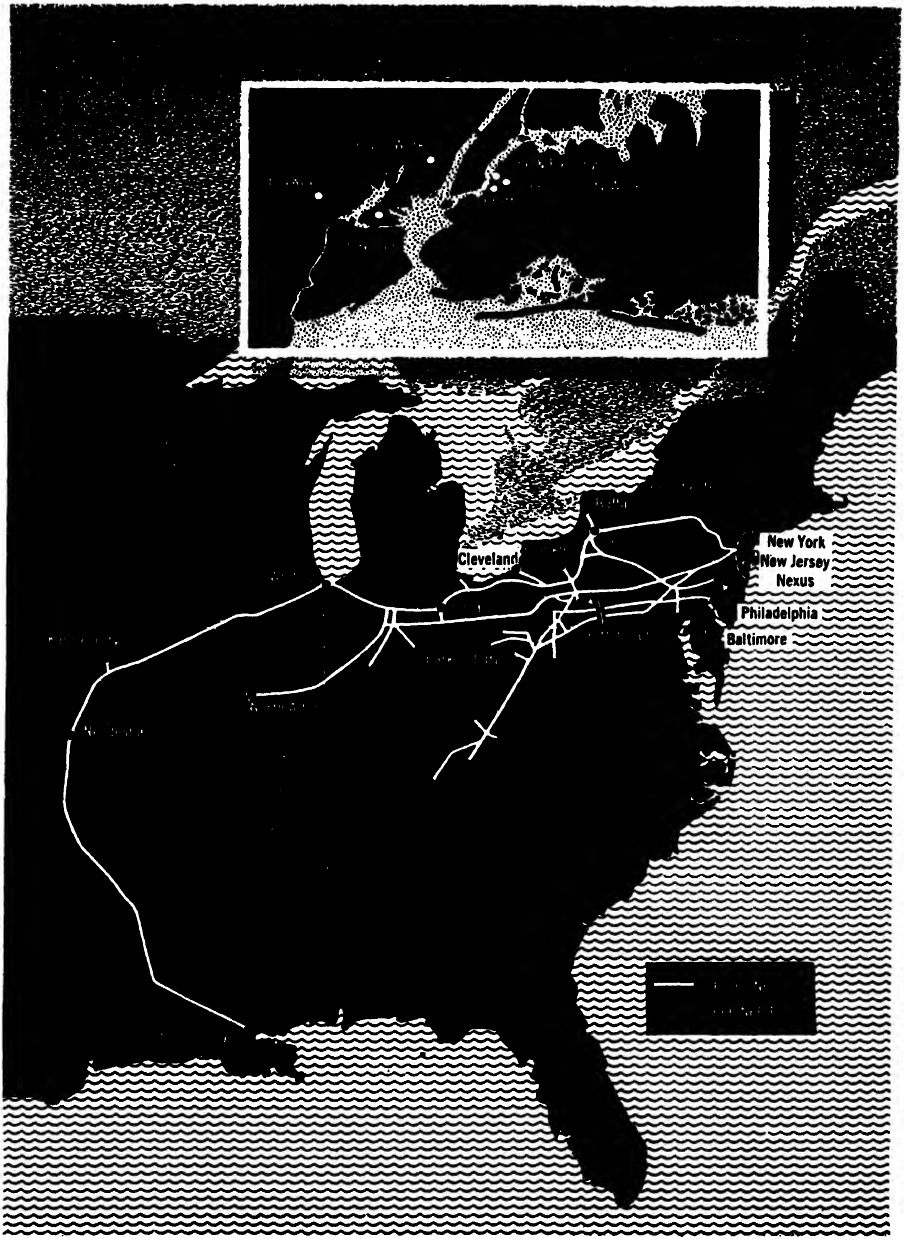
Responsibility for dealing with refining problems rested on the Manufacturing Committee. Regular attendants at conferences of the group were the general managers of the refineries in or near New York, among them at one time or another being J. H. Alexander and James Smith of Bayonne, George B. Gifford of the Eagle Works, Clarence Vose and Herbert L. Pratt of East River operations, H. P. Chamberlain of Atlas Refining, and J. W. Van Dyke of Atlantic Refining. Among those who participated occasionally were D. G. Scofield of the California companies and W. P. Cowan and W. M. Burton of Indiana Standard. H. C. Folger, Jr., acted as chairman of the Committee until he became a director of Jersey Standard, after which James Smith, general manager of Jersey Standard's refining, headed the group. The secretary was George W. McKnight.[1]

RESPONSE TO INCREASING DEMAND

Having made strenuous and continuous efforts to develop and maintain predominance in the American market prior to 1899, Standard Oil officials had no intention of relinquishing their relative position in the American petroleum industry after that date. Since the market grew rapidly, expansion in the volume of manufactured products obviously was imperative.

When Jersey Standard became the parent company in June, 1899, it and its affiliates owned and operated in the United States thirteen refineries and five lubricating oil works. Of the refining units, Jersey Standard possessed the two at Bayonne and Baltimore, New York Standard five (Pratt, Sone & Fleming, Long Island, Olean, and Atlas—all in New York State), and Atlantic Refining two (Philadelphia and Pittsburgh); four other companies had one each—Solar Refining at Lima, Ohio Standard at Cleveland, Indiana Standard at Whiting, and The Standard Oil Company (Kansas) at Neodesha. Of the lubricating oil works, the Parkersburg plant of Jersey Standard, the Eclipse Works of Atlantic Refining, and the Rochester unit of Vacuum stood as independent units, but the Eagle Works and Queens County Works operated as integral parts of the groups centering at Bayonne and on the East River respectively.

Twelve and a half years later Standard Oil men had added eight new plants to the list. All the old units continued in operation, though Olean now was owned by the Vacuum Oil Company. One new refinery began



Location of Refineries and Pipelines of Standard Oil Company (New Jersey) and Its Affiliates East of the Rockies, 1911

charging stills in December, 1899, the next in 1902, another a year later, one in 1904, another in 1908, two more in 1909, and the final one in November, 1911. In order of initial operation, the Corsicana plant belonged to the Corsicana Refining Company (Magnolia Petroleum Company after April, 1911), which had an indirect connection with Standard Oil; Point Richmond to the Pacific Coast Oil Company; the Burt (sometimes called the Chaison) Refinery to the Security Oil Company (Magnolia Petroleum Company after April, 1911); both Sugar Creek near Kansas City, Missouri, and Wood River at North Alton, Illinois, to Indiana Standard; Baton Rouge to the Standard Oil Company of Louisiana; Bayway at Linden, New Jersey, to Jersey Standard; and El Segundo to California Standard. (See maps on pages 351 and 411.) Factors in location of these plants are analyzed in the next section of this chapter. Neither Jersey Standard with its affiliates nor any other oil company in the United States had constructed so many new plants over so wide an area in any previous decade.

In the newer areas, Standard Oil officials concentrated upon expanding their own plant and did not adopt the practice of buying up and dismantling competing refineries, as had been done in earlier years in Eastern states. Records reveal no purchase of competitors' plants among the scores that sprang up in or near the new producing fields in California, Texas, Oklahoma, Kansas, and Illinois. The small West Alameda unit was acquired with the assets of the Pacific Coast Oil Company in the course of buying an integrated business as a nucleus for expansion, not for reducing refining capacity.

On the other hand, Standard Oil men did not discontinue entirely the elimination of competing capacity in the Oil Regions and Ohio, though no major purchases were made after 1901. The entire output of a small refinery at Marietta, Ohio—the Argand Refining Company—was tied up by contract in 1897; then all the shares of the company were purchased, and the plant was finally dismantled by 1901.[2] Much more important than action on Argand was the closing of the plants of The Manhattan Oil Company at Galatea, Ohio, and of Scofield, Shurmer & Teagle in Cleveland. Having purchased the stock of The Manhattan Company in 1899 through an English corporation financed by James McDonald with funds furnished to him by New York Standard under a special account with the Anglo-American Oil Company, Limited, the executives at 26 Broadway stopped the operation of the thirty-thousand-barrel-daily re-

finery almost at once, though it was not completely dismantled until 1909. When Jersey Standard acquired the business of Scofield, Shurmer & Teagle in 1901, at least two manufacturing plants of unascertained capacity were included in the purchase and were closed immediately. They were poorly located for trade west of Ohio, for which Standard Oil had erected one of its strongest refining units at Whiting. This fact probably accounted in part for the willingness of the formerly violently independent firm, Scofield, Shurmer & Teagle, to dispose of its property.[3] Several small Pennsylvania specialty works, processing petrolatum and similar products, were purchased prior to 1904, and even at that date some field men of Standard Oil were of the opinion that it might be advisable to eliminate others. The still proud areas of Ohio and the Appalachian region both were losing in the competition from new and expanding plants strategically located in relation to markets and new producing fields.

As Table 37 shows, in Ohio and the Oil Regions Standard Oil's refineries and lubricating oil works barely held their own in most cases. While the output of several plants increased slightly, the formerly great Cleveland plant of Ohio Standard sank to a capacity of 3,371 barrels daily—one-third of the more than ten thousand barrels daily controlled by the company in the spring of 1872.[4]

Meanwhile, the total capacity of Jersey Standard and its affiliates grew rapidly. Between 1906 and 1911 construction added a total of 86,000 barrels to Standard Oil's average daily capacity. Of this increase 12,000 barrels were in California, more than 37,000 at Whiting and in the Mississippi Valley, and over 34,000 along the Atlantic Coast. In the latter area, decline occurred only in the Long Island and Pratt plants of New York Standard, while Jersey Standard furnished the chief expansion by building the Bayway Refinery and enhancing the capacity at Bayonne by 11,000 barrels. Yet it is noteworthy that the rate of growth of the combined capacity of Indiana Standard's manufacturing units was greater than that for the Jersey Company itself—70 per cent for the former and 60 for the latter.

Nevertheless, the plants of the Jersey Company stood out as the leading units in the Standard Oil combination in 1911. They had more than 27 per cent of the capacity of all refineries in the family and distilled 29 per cent of all the crude oil actually run by them in that year.[5] Indiana Standard came second, but the capacity of its plants accounted for less than 22 per cent of the total.

Table 37 ESTIMATED DAILY CAPACITY OF REFINERIES IN THE UNITED STATES OF STANDARD OIL COMPANY (NEW JERSEY) AND ITS AFFILIATES,[a] 1906 AND 1911

In barrels of 42 gallons

Company	Plant	Location	1906	Sub-total	1911	Sub-total
Atlantic Refining Co., The	Eclipse Works	Franklin, Pa.	8,000		9,000	
	Philadelphia	Philadelphia, Pa.	41,090		42,613	
	Marcus Hook	Philadelphia, Pa.	[b]		[b]	
	Pittsburgh	Pittsburgh, Pa.	2,000	51,090	2,765	54,378
Solar Refining Co., The	Solar	Lima, Ohio	5,100	5,100	6,407	6,407
Standard Oil Co. (California)	Point Richmond	Richmond, California	28,727		25,727	
	El Segundo	Redondo Beach, California		28,727	15,000	40,727
Standard Oil Co. (Indiana)	Sugar Creek	Kansas City, Mo.	16,000		18,000	
	Whiting	Whiting, Ind.	22,446		37,197	
	Wood River	North Alton, Ill.		38,446	10,259	65,456
Standard Oil Co. (Kansas), The	Neodesha	Neodesha, Kans.	8,809	8,809	11,964	11,964
Standard Oil Co. of Louisiana	Baton Rouge	Baton Rouge, La.			7,139	7,139
Standard Oil Co. (New Jersey)	Baltimore	Baltimore, Md.	6,046		6,654	
	Bayonne	Bayonne, N. J.	33,576		44,662[c]	
	Bayway	Linden, N. J.			17,176	
	Eagle Works	Communipaw, N. J.	9,026		11,238	
	Parkersburg Works	Parkersburg, W. Va.	2,683	51,331	2,589	82,319

Table 37 (Continued)

Company	Plant	Location	1906	Sub-total	1911	Sub-total
Standard Oil Co. of New York	Atlas	Buffalo, N. Y.	3,078		4,053	
	Queens County Works	Long Island City, N. Y.	[b]		[b]	
	Long Island	Long Island City, N. Y.	5,343		4,286	
	Pratt	Brooklyn, N. Y.	4,326		3,684	
	Sone & Fleming	Brooklyn, N.Y.	10,316	23,063	13,705	25,728
Standard Oil Co. (Ohio), The	Cleveland	Cleveland, Ohio	5,816	5,816	3,371	3,371
Vacuum Oil Co.	Vacuum	Rochester, N. Y.	4,500		5,415	
	Olean	Olean, N. Y.	[b]	4,500	[b]	5,415
Total				216,882		302,904

[a] No data were found on the capacity of the plants of the Corsicana Refining Co., Corsicana, or the Security Oil Co., Beaumont, Texas. The relationship of these companies to Jersey Standard is discussed in the text. Both plants were owned by the Magnolia Petroleum Co. after April, 1911.

[b] The Marcus Hook Works were operated as an adjunct of the Philadelphia plant; the Queens County Works processed the lubricating oil distillate of the Pratt and Long Island plants; and the Olean Refinery sent its lubricating oil distillate to the Rochester Works.

[c] Includes two stills operated for the Vacuum Oil Co.

Source: SONJ, collection of predissolution data. The data for both years pictured the situation at the end of the year. The refinery of The Manhattan Oil Co., listed in the data for 1906, was inoperative and partially dismantled at that time.

The growth in consumption of crude oil by refineries of Standard Oil was more significant than increase in capacity. Although, to obtain the exact amount of crude put through the refineries to 1906, an undetermined amount of petroleum sold without being processed should be deducted from figures of crude oil consumed, the statistics reflect adequately the changes over time. As manifest in Table 38, from 1899 to 1906 the petro-

Table 38 CRUDE OIL CONSUMED ANNUALLY BY STANDARD OIL REFINERIES IN THE UNITED STATES, 1899-1911

In barrels of 42 gallons

Year	*Crude Consumed*
1899	45,847,279
1900	44,575,231
1901	48,527,527
1902	51,922,316
1903	52,373,513
1904	55,852,313
1905	60,030,736
1906	64,958,301
1906	62,778,540
1907	71,844,045
1908	74,933,040
1909	81,038,030
1910	94,338,265
1911	99,580,760

[a] The data for the years from 1899 to 1906 include crude oil purchased and resold, while the second group (1906 to 1911) includes only actual crude oil distilled. The authors obtained the annual figures for the years 1906 to 1911 by multiplying the total distilled daily by 365.
Source: *U.S.* v. *SONJ*, XIX, 626 Defendant's Exhibit No. 267; SONJ, "Total Crude Oil Distilled—All Works—42's Daily," 1906-1925.

leum consumed rose from 45,847,279 barrels to 64,958,301; the increase over the seven years was 41.6 per cent. Expansion was more rapid after 1906. The crude oil actually distilled by Standard Oil plants increased from 62,778,540 barrels in 1906 to 99,580,760 five years later, a rise of 58.6 per cent. Crude oil consumed by Standard Oil refineries in 1911 exceeded that in 1899 by considerably more than 100 per cent.

The refineries of Standard Oil were run almost to capacity in 1911. Deducting the 15,000 barrels daily of El Segundo, which went into operation only at the end of the year, the estimated capacity figure was 287,904

barrels daily to be compared with 272,824 barrels of crude oil actually distilled. The crude oil distilled by all Standard Oil refineries amounted to almost 95 per cent of capacity. The comparable figure for Jersey Standard's directly owned units was about 1 per cent higher than for all plants of the family.

Although the efforts of Standard Oil companies seemed prodigious, competitors were moving much more rapidly. According to reports by the Bureau of the Census, the total number of manufacturing establishments in the petroleum industry rose from 67 in 1899 to 147 ten years later. Standard Oil had added only seven of the additional eighty, but many of the latter were small. However, several competitors had become strong, integrated companies with excellent facilities, among them Union, Associated, Texas, Gulf, Sun, and Pure Oil, not to mention quasi-independent Tide Water. Data are lacking on the percentage of all petroleum distilled in the United States in 1899 that was run by Standard Oil plants. Since the combination bought part of its supplies from outside sources, Standard Oil refineries undoubtedly processed less than the 83.7 per cent of all petroleum products in the United States which the combination marketed in 1898. According to a statement made by Folger to Elliott in 1911, Standard Oil units processed 76 per cent of the petroleum distilled by all refineries in the United States during 1904 and 66 per cent five years later.[6] Since the latter figure checks with other available information, it may be assumed that the 1904 percentage is accurate. A later estimate by a Standard Oil official credited refineries of the combination east of Colorado with a maximum of 68.5 per cent of crude oil consumed by all refineries in that area in the United States in 1911.[7] Collectively, aggressive competitors had put Standard Oil upon the defensive and had seized an increasing proportion of refining operations.

A relative decline in throughput was only one of many worries badgering the Manufacturing Committee and others responsible for Standard Oil refining. Vigorous competition in both foreign and domestic markets demanded a never-ending drive to reduce manufacturing costs, including the wholesale adoption of new techniques, scrapping of equipment, developing new by-products, and wise location of new refineries.

LOCATION OF REFINERIES—NEW AND OLD

Standard Oil manufacturers had to weigh a host of factors in locating new refineries and in deciding which old ones to expand or contract. Proximity to producing wells was a factor but not the primary one. Trans-

portation costs on finished products to markets as well as on supplies to refineries were important considerations. The location of markets, therefore, assumed primary significance. Among other elements to be evaluated were the availability of fuel and labor, ground space for expansion of the plant, water supply, taxes, state and municipal regulatory provisions, and available fire protection.[8] All these conflicting pulls had to be measured simultaneously in deciding upon the specific location of a plant.

The inflexible nature of a large refinery placed a premium upon long-range planning and a careful evaluation of strategic factors in location. The historical record of continuous changes in sources of supply and rapid exhaustion of producing areas emphasized the necessity of locating a large refinery with an eye to both existing production and potential staying powers of fields. As C. F. Lufkin phrased the Standard Oil attitude, petroleum fields were "transitory and migratory."[9] When the capital investment was large, the plant could not be dismantled or moved without incurring heavy expenses. Prime consideration had to be given to room for expansion rather than to the prospect of changing location. In selecting a location for a refinery which would assure the most economical transportation for both crude oil and the finished products, future as well as current conditions had to be considered.

The emergence of significant new producing areas near expanding markets tended to pull some refining capacity toward them. In the instances of the Burt, Sugar Creek, Wood River, and Baton Rouge refineries, costs of transporting crude oil to those new establishments from neighboring fields were much less than on the Texas, Oklahoma, and Illinois petroleum which traveled to older plants at either Whiting or Cleveland or points farther east. Wood River had fields of coal near by, if that was used for fuel. Location factors, including that of crude supply, for Point Richmond and El Segundo were discussed in Chapter 12. Among the new refineries erected during the years from 1899 to 1911, only the Bayway plant was really remote from the new producing regions.

As the piping of Ohio, Illinois, and Mid-Continent crude to the East Coast indicates, keeping down transportation costs on supplies was not a preponderant determinant in selecting the site of a refinery at that time. The relative flexibility of pipelines enabled manufacturing plants to be erected in accordance with the dictates of other factors; pipes were laid to the producing areas, and the crude oil was pumped to the refinery; pipes could be and were extended to new wells and fields as they appeared. In an integrated business like that of Jersey Standard and its affili-

ates, the significant consideration was the total cost of transportation from well to consumer. When tankers took on crude oil, as at Gulf Coast ports and in southern California, company-owned vessels carried the supply to coastal refineries. This procedure provided economical transportation, and the method of accounting showed a profit on marine transportation. In both those areas the crude oil yielded a high percentage of fuel oil for use in the refinery, which in turn eliminated the necessity of concern about high costs of transporting coal. Freight charges on less bulky supplies, such as sulphuric acid and caustic soda, contributed relatively little to the ultimate costs of finished products and hence exerted slight, if any, influence upon the location of plants. Far more important was the imperative necessity of choosing a site adequately provided with a large supply of water for cooling purposes and for steam-generating boilers.

The supply of labor usually posed problems in the early stages of a new refining project. Superintendents, foremen, and stillmen were drawn from the Standard Oil reservoir of skilled technicians and lesser managers in established plants. Among their most important tasks was the training of workmen drawn from neighboring localities in the intricacies of operating a new refinery. Since recruiting a considerable number of workers was necessary in building and operating a new plant, the weight of that element upon selecting a site was in favor of a location in or near centers of population.

If there were two chief determinants in selecting the exact spot for a refinery, they were the location of the market and available facilities for transporting the finished products. Given the immobility of the refinery, the flexibility of crude oil transportation, and the relative stability of existing markets, Standard Oil men assigned heavy weight to minimizing the costs of moving kerosene, gasoline, and other petroleum derivatives to distributors and consumers.

Refineries serving the vast market of the Mississippi Basin relied heavily upon location at railroad junction points, usually supplemented by alternative water transportation on rivers or lakes. For example, some products from Whiting moved by barge or tanker on the Great Lakes, but the refinery's greatest advantage was that it lay within the Chicago switching district, the leading railroad junction point in Mid-America. Furthermore, it was in a favorable position to utilize intrastate rates until the laws and the courts closed the loopholes. In addition to enjoying excellent railroad facilities, the plants at Cleveland, North Alton, Sugar Creek, and Baton Rouge were situated either on lakes or on navigable rivers. The

last-named three, and the units in Texas, also permitted much shorter railroad hauls and lower freight charges to many distributors and consumers than on shipments in an earlier period to the entire Mississippi Valley region from Cleveland, Lima, and Whiting.

Standard Oil refineries serving coastal and foreign markets were all located at points accessible to sailing ships and ocean-going tankers, the latter being the least expensive method of carrying petroleum products in bulk. Point Richmond and El Segundo sent their products to the Far East, Hawaii, Alaska, and Pacific Coast ports. Kerosene, gasoline, and other products moved to Europe, Asia, Africa, the east coast of South America, and Atlantic Coast seaports via tankers and sailing ships chiefly from New York, Philadelphia, and Baltimore.

The Baton Rouge refinery furnished an example of focusing a wide range of considerations upon one locational problem. The plant was situated on the first high land on the Mississippi above the delta. It enjoyed the advantage of safety from flooding, yet was accessible to ocean-going tankers. Water was plentiful. The 213 acres originally purchased seemed adequate for expansion, though the amount was later increased to 939. Skilled labor and experts in construction and operation came from the Burt Refinery and other Standard Oil units. Near-by Baton Rouge and its hinterland afforded a plentiful supply of unskilled labor and adequate railroad transportation to distributing points in Louisiana and adjacent states. Crude oil came via pipeline from the Oklahoma fields, shortly supplemented by a supply from Caddo Parish in Louisiana itself. The location at Baton Rouge gave Standard Oil the same advantage which its Gulf Coast competitors had, and which refineries of the combination on the East Coast lacked. To obtain the advantage of a refinery at Baton Rouge must have given no little satisfaction to Standard Oil executives who had been hampered in developing both refining and marketing operations in Texas by the excesses of the affiliated Waters-Pierce Oil Company, the resulting ill will, and the strict application of Texas antitrust laws.

The location of Standard Oil refineries in the United States in 1911 shows clearly the importance of water transport in distributing products. In 1911, about 78 per cent of the refining capacity was easily accessible to ocean-going or Great Lakes tankers and barges. Because of the importance of European trade and that of the large Eastern coastal cities, 48 per cent was on the Atlantic Ocean, while the new refinery at Baton Rouge accounted for another 2 per cent. The Great Lakes had 15 per cent and the Pacific Coast 13. Less than 7 per cent of Standard Oil's refining capacity was in the old Appalachian region and only 2 per cent at Lima,

Ohio. The final 13 per cent was in or near the newer Mid-Continent field to serve near-by inland markets, and a large part of that capacity was either on the Missouri River or the Mississippi; only the small plants at Rochester, Olean, Franklin, Lima, and Neodesha relied almost entirely upon rail transport.[10]

By 1911 Jersey Standard was operating a larger amount of refining capacity than any other Standard Oil company, and most of its output was produced on navigable water on the East Coast. The largest plant in the whole Standard Oil empire, Bayonne, with a daily capacity of 44,600 barrels, continued to enjoy the advantages of the excellent location it had possessed for more than three decades. Bayway, the new refinery, also well situated for the important European trade, was connected by pipeline to Bayonne's piers and already had a capacity of over 17,000 barrels per day. It outranked both the Eagle Lubricating Oil Works, with its some 11,000 barrels daily, and the smaller Baltimore Refinery, which did not reach 7,000 barrels per day. All these were on or near navigable water with access to the ocean tankers. Among Jersey Standard refineries, only the small Parkersburg plant, which specialized in lubricants, was near oil fields, and it had the Ohio River, in addition to the Baltimore & Ohio Railroad, to carry some of its manufactured products.

Viewed as a whole, the locational pattern of Standard Oil refineries in the United States showed a continuation of the earlier trend toward expanding the size and number of plants along the seaboard but manifested a new tendency toward situating relatively small units near local markets in the Mississippi Basin. The refineries at Neodesha, Sugar Creek, Wood River, Lima, Cleveland, and Baton Rouge all were located contiguous to important local sales districts, though the last-named plant also manufactured for export. Ohio Standard's Cleveland works was one of the smallest in the Standard Oil combination by 1911 and shared with Solar Refining the market of Ohio, eastern Michigan, and part of Indiana. Whiting still catered to consumers in Canada, in the Upper Mississippi Valley, and in much of the territory south of the Ohio River. The largest capacity, however, was located in plants manufacturing not only for local markets but also for foreign trade at New York, Philadelphia, Baltimore, Baton Rouge, San Francisco, and Los Angeles.[11]

FRONTAL ATTACK ON COSTS

At the end of the 1890's Standard Oil executives were under increasing pressure to cut their costs of manufacturing. They had achieved perhaps their minimum expenses, given their current manufacturing processes, but

they faced foreign competitors who enjoyed much lower costs. Standard Oil responded by adopting two major technological changes in the first decade of the twentieth century.

Analyses of manufacturing for the combination as a whole showed costs rising after 1896. For making one gallon of petroleum products, average "costs of manufacture"—a term used to include labor and miscellaneous expenses but excluding "costs not embraced in manufacture," "extraordinary costs," and the cost of crude oil—had declined from .534 cents in 1884 to .293 cents in 1896, the lowest point revealed in extant records. By the next year the comparable figure was .379 cents per gallon, reflecting a rise in costs in industry in general. Within another three years, higher living costs and demands from workers culminated in the granting by management of higher hourly wages in refineries and the nine-hour day for all but process men.

Much more weighty than manufacturing costs in total costs of petroleum products from the refineries was the rise in price of crude oil. Pennsylvania-grade petroleum rose from an average of $0.78625 per barrel in 1897 to $1.3525 three years later, and Lima-Indiana from about $0.435 to more than $0.98.[12]

Simultaneously, foreign competitors were taking advantage of favorable circumstances in their areas of operation. Expanding Russian production of crude oil surpassed that of the United States at the turn of the century, and prices in the Caucasus began to decline late in 1900.[13] To Russian refiners kerosene was still a by-product of fuel oil manufacture. Hence, since they also had advantages over American manufacturers in labor costs and proximity to some markets, the Nobel, Rothschild, and Shell groups could and did price their products below those of Standard Oil in both Europe and Asia. In the latter area, both Russian and American oils had to face the competition of Royal Dutch, Dordtsche Petroleum, and other small corporations, all of which were either integrated companies, or worked with one, and had low labor costs and very low expenses in carrying their products to neighboring markets.

If Standard Oil officials wanted to retain their foreign markets, they had to meet the competition. Economic necessity dictated it. Shaving down the average cost of making a gallon of kerosene was a part of the campaign. It was not fortuitous that new techniques were first perfected in coastal refineries manufacturing for export.

Standard Oil and other companies in the United States had plenty of precedent for adoption of the most obvious method of reducing the costs

of manufacturing—continuous distillation, that is, without the interruption characteristic of batch distillation. As early as 1860 Stombs and Brace had received a patent in the United States for a continuous process. Other patents were granted to Tait and Avis in 1867, to Hill and Thumm three years later, to Samuel Van Syckel (builder of the first practical pipeline) in 1877, and to Rycroft and Mason in 1886. Meanwhile, in Europe some refiners had actually practiced continuous distillation. The Nobels inaugurated a continuous method in 1883 for separating naphthas, kerosenes, and residual fuel oil. At some later date they applied the system to making lubricants. A Galician refiner used the continuous method at least by 1890.[14] Thomson McGowan had suggested the use of continuous distillation of crude oil by Standard Oil as early as 1886. He had pointed out that the method would decrease the costs of construction, fuel, and labor, while increasing output from the same still capacity and improving the fractionation.[15] Nevertheless, Standard Oil adhered to the batch system.

Why had not Standard Oil adopted the continuous method for distillation of crude oil in the 1880's? At this late date an answer—an eclectic one—can be supplied only by inference. Competitors in the United States had not succeeded in making revolutionary changes in fractionation, so there was no great pressure on the home front. Though competition in foreign markets was strong earlier, it became more serious in the late nineties. In Europe prior to that time Standard Oil had met competition by advanced marketing techniques introduced by companies under the influence or control of the combination. At the same time, New York Standard had assumed responsibility for profit or loss on sales direct to merchants in Oriental seaports and had met or anticipated price cuts by competitors. In addition to expending vast sums in both Europe and Asia, Standard Oil had put even more into the successful campaign to produce, transport, and refine Lima-Indiana petroleum. The total investment in old and new plant was certainly large enough to give pause to dollar-conscious executives before introducing costly changes.

Differences in crude oils, objectives of refiners, and technological problems also had a bearing upon the delay. When first introduced, the continuous process of the Nobels was feasible only for separation of naphthas, kerosenes, and fuel oil. Intent on maximizing the residuum, the Swedish brothers had no need for raising the contents of the stills to high temperatures, with attendant dangers from frothing and boiling over. By the time their method had been adapted to separating lubricating oils, Standard Oil and other companies were nearer to adoption of the continuous proc-

ess. Even then American companies had special problems to solve: the large percentage of dissolved gas in Pennsylvania-grade petroleum, concentration of firms in the United States upon maximizing the kerosene yield, and the consequent heavy character of the residuum after preliminary distillation complicated the application of the continuous technique in America. The Nobel, the Galician, and the Scotch shale methods, among others, also called for the use of heat exchangers—instruments for utilizing waste heat from steam or distillate for preheating raw petroleum—which were not manufactured in America and had to be improvised by the first plants to inaugurate continuous distillation of crude oil on this side of the Atlantic.

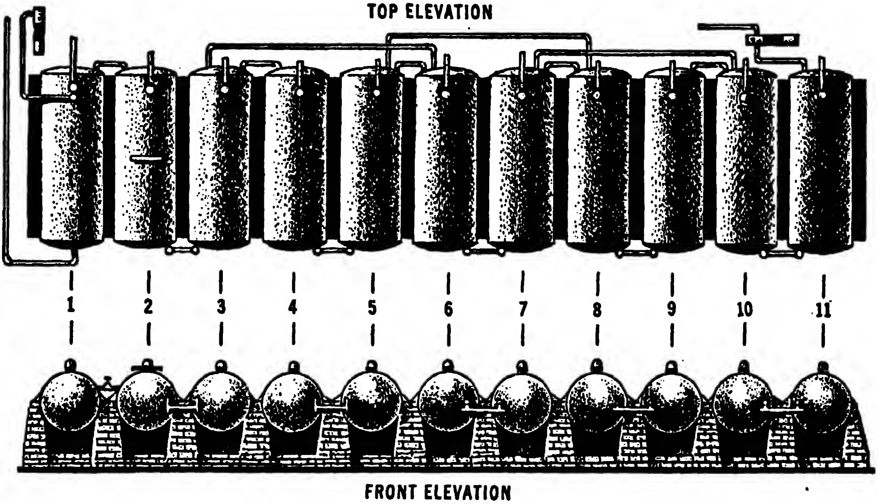


Diagram of Battery of Livingston's Continuous Stills

After some years of experimentation, a Standard Oil plant achieved the first successful large-scale application of the continuous method to the distillation of crude oil in the United States. In 1899 Max Livingston, superintendent of the Point Breeze Refinery of The Atlantic Refining Company, applied for a patent, which he received (No. 728,257) four years later and assigned to his employer. All continuous distillation installations in use in the United States until the World War I period were said to be based upon that patent.[16] Quite similar to the system utilized in the Caucasus and Galicia, the Livingston process accomplished fractionation of petroleum by selective distillation.

In outline the system was simplicity itself. As indicated by the diagram

on page 424, Livingston set up in a line a series of shell stills—horizontal boilers over individual fireboxes of brickwork. Each still was connected with the next by a short pipe, each connection after the preparatory still being set at a progressively lower level to permit flow of distillates by gravity. A similar series of longer connections, say between stills Nos. 3 and 6, 5 and 8, and 7 and 10 in a battery of eleven, made possible shutting off two distilling units for cleaning or repair, thus permitting continuous utilization of the remainder of the group. Under each of the stills even temperatures were maintained, each progressively higher, so that fractions of petroleum of different boiling points vaporized and were carried off to the condensers. If desired, the process of cracking, previously discussed,[17] occurred in the stills at the end of the series. Residuum was drawn off from the last still in the series for such additional processing into wax and lubricants as the orders of the refinery justified.

Advantages of the system were numerous. Better use of capacity and of labor was achieved by maintaining distillation even when blocks of two stills were cut out for cleaning or repairs. There was less wear and tear on the stills; the greatest single factor in deterioration was alternating heating and cooling, which occurred much less often under the Livingston method than under batch distillation. Although rerunning in steam stills was required for high-quality naphthas and kerosenes, less was called for than before; the continuous system, after some improvements, gave better fractionation in the first distillation than did batch stills. Savings in fuel, estimated as high as 25 per cent,[18] were augmented in Standard Oil plants by using flue gases in Van Dyke tubular boilers to generate superheated steam, which in turn passed through coils within the preparatory still to preheat the raw crude.

Within a short time Livingston's method won wide acceptance in the American petroleum industry. Among Standard Oil plants which adopted the process for a part of their operations before the end of 1906 were Point Richmond, Neodesha, Eagle, Bayonne, Baltimore, and Sone & Fleming, but the last two had abandoned it by the end of the year. The Sugar Creek and Long Island refineries concentrated entirely upon the continuous type. It was most useful in those plants which themselves made no effort to manufacture lubricants or wax from Pennsylvania-grade oil and in the Gulf Coast and California regions, where, as at Baku, a large percentage of the crude was best utilized for industrial fuel. Prominent among other early users of continuous distillation was the Gulf Refining Company.[19]

Every instrument devised by man has its limitations, and the Livingston process was no exception. Its limited range in fractionating naphthas was exposed by the increasing demand for a variety of gasoline motor fuels. In the early days its use was restricted largely to Lima-Indiana petroleum. The advent of Kansas, Illinois, and Oklahoma crudes necessitated special handling of each, which complicated the distillation process. Heat exchangers made by workmen in the plants did not always function properly. Some annuitants from the Baltimore Refinery remember stills boiling over occasionally, though they cannot recall any lives being lost. For plants manufacturing the whole range of products from liquefiable gases to paraffin wax and paraffin oils, Standard Oil managers needed a method that would enable them to separate accurately as many fractions of the crude oil as the market required—from the top all the way down to coke.

Again the innovation came at Point Breeze. This time the leading figure was J. W. Van Dyke, long associated with The Solar Refining Company, general manager of the Point Breeze plant in 1903, and director and vice-president of Atlantic Refining by 1904. Working with him in the new development was W. M. Irish, experienced at the Lima and Olean refineries before becoming assistant general manager at Philadelphia in 1903. Both men, particularly Van Dyke, had to their credit many practical additions to petroleum technology and both ultimately reached the presidency of Atlantic Refining.[20] The two inventors had an experimental plant operating in 1904, demonstrated the practicability of their technique to a group of Standard Oil refinery superintendents in 1905, applied for a patent four years later, and received it in 1913.

In contrast to fractionation of petroleum by Livingston's selective and continuous distillation, Van Dyke and Irish concentrated upon separation of components by selective condensation under the batch system. Above each water-cooled condenser box of the conventional type they erected a two-sectioned tower. The lower section was a brick-insulated, stone-packed drum; the upper, a large chimney-like pipe enclosing a series of air-cooled tubes. Vapors from the still rose upward over the stones, which increased the condensing of some gases; they then moved through the tubes in the upper section, the condensation in which was regulated by the use of draught doors on the outer casing. Near the main tower Van Dyke and Irish placed a second or auxiliary tower consisting of a steel-encased set of air-cooled pipes, which also acted as a partial condenser. Three outlets led off the condensate from this system, thus permitting close control of fractionation. Condensation of residual vapors occurred

in the regular condenser coils. When gas oil distillate appeared, it could be turned, by control valves, back into the still for cracking. These were the main operating principles of the so-called Van Dyke tower stills.[21]

Other arrangements in connection with the Van Dyke tower stills effected economies in operations. For example, one smokestack served four fireboxes, and one receiving house eight stills. Van Dyke boilers generated superheated steam, which was utilized to wash out the towers, to preheat the still, and to aid in removing coke when the unit was cleaned.

The picture facing page 418 shows two Van Dyke tower arrangements for two adjoining crude stills at Bayway in 1908. Each of the two-sectioned main towers and the boxlike intermediate towers near them are easily identified. Just below them are the condenser boxes.

The Van Dyke tower still afforded greater flexibility than had ever before been attained by refiners in the American petroleum industry. Not only did the method give more exact separation of naphtha and kerosene fractions than any previous system; it also turned out gas oil and lubricating oil or paraffin distillate cuts as dictated by the conditions of the market for the various products. It was even more effective than the continuous method in obviating rerunning of distillates.

Little evidence is available concerning the acceptance of the Van Dyke tower in the American petroleum industry, but it appears that only Standard Oil refiners applied the idea in this period. The degree of utilization depended upon the objective of the plant and the crude oil used. Those plants running oil yielding a high percentage of industrial fuel retained the Livingston continuous system. Those running crudes with a relatively high proportion of paraffin distillate used the continuous method, if, as did the Long Island Refinery, they had a separate unit (the Queens County Works) for processing their bottom cut. Those units which manufactured a whole range of petroleum products, such as Bayonne and Bayway, relied heavily upon the Van Dyke tower stills. Bayonne, the second refinery to adopt the Van Dyke-Irish innovation, had converted a large part of its capacity to tower stills by the end of 1911; of its net crude distilling capacity of 42,701 barrels daily, approximately 60 per cent was by tower and the remainder by batch. Builders of Bayway concentrated upon towers for crude distillation, all the sixty-six crude stills operating in 1911 being of that type. Both Bayway and Bayonne retained continuous operation of steam rerun stills.[22] Bayonne also used the continuous system on sweetening stills for Lima-Indiana crude, as Table 39 shows.

The evolution of the Van Dyke-Irish tower still well exemplifies the truism that an invention is made only to be modified and improved. The two inventors waited until many changes had been tried by stillmen and superintendents in several Standard Oil plants before applying for a patent in 1909. At that time they offered a tested, relatively efficient mechanism, but modifications continued nevertheless. For example, within two years practical operatives had elevated the upper end of the long vapor line from the still to the main tower in order to facilitate the return of unvaporized liquid carried upward by the gases.

Furthermore, the improved fractionation and control of quality afforded by the Van Dyke tower stills stimulated other researchers and experimenters outside Standard Oil companies to improve refining methods. Trumble's evaporator and other methods of separating the top fractions in California have already been mentioned in Chapter 12. Other technologists utilized baffle plates with holes instead of stone for separation. Out of the total experimentation and gradual modification emerged the modern bubble tower, the efficient fractionating instrument of today. For the petroleum industry, therefore, the Van Dyke tower was, as it has been called, a "noteworthy and revolutionary step" in the development of the science of refining.[23]

BAYONNE AND THE RISING TEMPO OF CHANGE

While Livingston, Van Dyke, and Irish were leading the frontal attack on costs by developing two commercially feasible methods of distilling crude oil of different types and for different end products, other Standard Oil men kept up a ceaseless campaign in other phases of manufacturing to reduce costs, to improve quality, and to develop by-products. Contributors of ideas ranged from foremen to chemists and superintendents, not to mention numerous researchers and technologists outside the Jersey Standard family. Modifications ranged from the new techniques for distilling crude to packaging the finished items for market. In terms of rapidity of change, from 1899 to 1911 the life of the refiner was "terribly hard," to take words out of the mouth of Christopher Robin's Alice. No better illustration of that fact could be found than in the operations of Jersey Standard itself.

The plants which the Jersey Company directly owned presented an excellent cross section of all the types within the combination, both in 1899 and in 1911. The Eagle Works concentrated on manufacturing lubricants and wax throughout the period, though the plant did prepare some

kerosene and naphtha for market. The works at Parkersburg gradually dropped the emphasis upon lubricants and increased the relative volume of other products. Baltimore was a typical small refinery of the Standard Oil group, operating not only a distilling and refining unit but also a naphtha finishing plant and a paraffin pressing and lubricating oil works, which was added in 1906. Bayway embodied the most advanced ideas in refinery construction when it began operation on January 1, 1909; its salable products included a range from naphthas to still coke. Throughout the period Bayonne was one of the largest plants in the family and by the end of the period justly boasted that it was the largest refinery in the world. It comprised three units—Number 1 Plant (Old Yard), Number 2 Plant, and Number 3 Plant, or Lower Yard—the three together manufacturing every basic petroleum derivative, except filtered oils and candles, and carrying on an imposing array of auxiliary functions.

Data on Bayonne for the years 1899 to 1911 are given in greater detail for several reasons. The Bayonne plant of Jersey Standard was the largest in the family, and it encompassed a wide range of activity. Furthermore, substantial data on its operations over the period have been preserved.

Managers of Bayonne's affairs changed frequently. The refinery had three general managers during the twelve-year period. J. H. Alexander resigned in 1901 to become a consultant on refining, though he remained on the Jersey Standard payroll at half-pay until 1906. One source suggests that he was asked to leave his post because a disastrous conflagration at Bayonne in July, 1900, pointed to inadequate protection of tankage against fire; another says that dramatic increases in the yields at the Number 2 Plant showed up Alexander's earlier inefficiency. The reorganization of 1899 pushed him out of a directorship with Jersey Standard, and he may have seized an opportunity to better himself financially by becoming a consultant; he certainly was not a young man and may have wished to lead a more leisurely life. At any rate, James Smith succeeded him as general manager of Jersey Standard's refining and necessarily assumed the responsibility for developments at Bayonne until he later became chairman of the Manufacturing Committee. George B. Gifford, nephew of H. H. Rogers with experience at the Pratt Refinery and at the Eagle Works, was the general manager at the end of the period. The man charged with carrying out the recommendations of the Manufacturing Committee, the policies of the Executive Committee, and the orders of the general managers was John E. Eggleston from 1900 through 1911. He succeeded Utley Wedge as superintendent in 1900 and supervised all the work of

Bayonne except for two years spent in starting the refinery of Româno-Americana, the Standard Oil affiliate in Romania.[24]

Bayonne managers accepted the Livingston and Van Dyke systems eagerly, though with some reservations about the former. They began converting steam rerun stills to continuous operations in May, 1899, crude stills in July, 1901, and sweetening stills for the Frasch process in April of the next year. Heat exchangers and Van Dyke boilers were used in the continuous process from the date of its inauguration. Experience at Bayonne showed the advantages in costs of continuous in comparison with batch distillation, but the old method separated the cuts more accurately than the new. Eggleston's men apparently could not operate the Livingston stills so effectively as did the men at Point Breeze or W. C. Koehler at the Sone & Fleming plant. Nevertheless, ten crude stills in the Number 2 Plant (Frasch process) and almost all of those in Number 3 Plant (Lower Yard) were operating on the continuous system by 1906. Given their reservations, however, the responsible men at Bayonne welcomed the Van Dyke tower stills for their more efficient separation of vapors and their capacity to effect fractionation down to coke. Conversion of reducing stills and crude stills started in 1906 and swung into wholesale change on the latter the next year with the dismantling of forty-four 600-barrel stills in the Lower Yard, to be replaced largely by 1,050- and 1,250-barrel Van Dykes.[25]

Table 39 substantiates several generalizations about changes in the Bayonne plant by 1911. New crude stills after 1900 were built about twice as large as those of the 1880's and 1890's, when six hundred barrels was the normal capacity. Both steam rerun and sweetening stills tended to be larger than those for the preliminary distillation of crude. With the advent of the Van Dyke towers, the tar stills were almost entirely converted to reducing stills, since the basic cuts for pressing out the wax were made in the preliminary distillation. Most significant, as in the case of the weapons of war over the last few centuries, the new methods did not entirely displace the old; they were just added to the old.

Switching to new processes constituted merely the beginning of the adjustments demanded of operators at Bayonne and other refining units during the years after 1899. Not the least of the problems were those occasioned by new types of crude oil. Among the five plants of the Jersey Company, the Eagle and Parkersburg continued to use Pennsylvania-grade oils. Parkersburg utilized largely Amber, Eureka, and Macksburg petroleum extracted and piped in the vicinity, and the plant at Com-

Table 39 STILLS AND CHARGING CAPACITIES AT BAYONNE REFINERY, BY PROCESSES, DECEMBER 31, 1911

In barrels of 42 gallons

	Process					
	Batch[a]		*Tower*[a]		*Continuous*[a]	
Type of Still and Charging Capacity	*No. of Stills*	*Total Charging Capacity*	*No. of Stills*	*Total Charging Capacity*	*No. of Stills*	*Total Charging Capacity*
Crude						
600	33	19,800				
1,050	40	42,000	42[b]	44,100		
1,250	4	5,000	44	55,000		
	77	66,800	86	99,100		
Steam Rerun						
1,000					10	10,000
1,580					10	15,800
					20	25,800
Tar[c]						
250	4	1,000				
Reducing[d]						
250	10	2,500				
350	2	700				
460	6	2,760				
550	8	4,400				
700	2	1,400				
1,000	5	5,000				
1,300	4	5,200				
	37	21,960				
Sweetening[e]						
1,250					5	6,250
1,350					5	6,750
1,600					9	14,400
1,900					13	24,700
					32	52,100
Totals	118	89,760	86	99,100	52	77,900

[a] Batch referred to old-style stills; tower to the Van Dyke; and continuous to Livingston.
[b] Included two stills operated for the Vacuum Oil Co.
[c] Used for distillation of tar and some slops.
[d] Primarily used for fractionating lubricating oils from which paraffin wax had been pressed.
[e] Used for sweetening under the Frasch process, running sour distillate, and rerunning some slops.

Source: SONJ, Bayonne Cost & Yield Statements, Estimated Still Capacity, Jan. 1, 1912. These statistics differ from some other evidence, but, since the other sources do not give complete coverage, the figures given above can be taken as, at least, an approximate picture of the distribution of capacity between the different methods in use in Bayonne in 1911. It is to be noted that these are capacity figures; some of the stills may have been inoperative.

munipaw got its raw material from other parts of the Appalachian region. Baltimore, Bayway, and Bayonne relied more and more upon Ohio, Indiana, and Illinois crudes, though others were run to the stills. Bayonne inaugurated the use of Texas Beaumont and Corsicana oils in 1901. Within two years the Texas crude distilled amounted to almost eight times the volume of Pennsylvania oil, though Texas oil disappeared from the Cost & Yield Statements in 1908. Others of more general utility had displaced it —Kansas oil appeared in 1906, Illinois a year later, and heavy Mexican early in 1911.[26] Noteworthy is the absence at Bayonne of Oklahoma petroleum, which went to other refineries in the East and Midwest.

Lists of crudes according to state of origin by no means exhausted the categories of types or indicated the difficulties in handling a wide variety of raw materials. Besides Pennsylvania-grade, which itself showed variations, the other basic types run at Bayonne were North Lima, South Lima, Indiana, Sour Illinois, Sweet Illinois, Parker Pool (Illinois), Kansas, and Mexican. Each of these had to be distilled and treated with greater or less variation in the processes. The differences in the crudes, their availability at a given time, current demands of marketers, and matters of convenience led to an amazing range of combinations and permutations in methods of distillation. For example, during the first six months of 1911, in addition to runs of the nine basic categories, Bayonne's Cost & Yield Statements recorded Sour Illinois run as North Lima, as Indiana, and as South Lima; Sweet Illinois as Indiana and as North Lima; Kansas as Indiana and as North Lima; Pennsylvania as Sweet Illinois; Indiana as Sour Illinois and as Sweet Illinois; North Lima as Sour Illinois; and Parker Pool as Sour Illinois. Throughput also included distillate known as "K. T. Oil," derived largely from Midwestern crudes and run for asphalt and road oils.

In response to the stimuli of new crudes, market demands, and competition, managers and workers at Bayonne labored year in and year out to adjust operations to the manufacture of new products. To mention a few outstanding changes, in 1902 they made provision for large-scale production of asphalt and for increasing their volume of a special tar for the Barber Asphalt Company. During the same year four stills were equipped to run maltha, another type of petroleum tar. A year later boilermakers and pipe fitters installed steam pipes in stills to run Beaumont crude to "K. T. Oil," and made other arrangements to manufacture black oils for lubricating purposes. In 1907 Bayonne expanded its facilities to manufacture pitch; two years later it did the same for road oils and also modified its plant to produce Polarine, the most famous of Standard Oil's

gasoline motor lubricants. In 1910 management agreed to invest over $453,000 at Bayonne in preparing to turn out oils to the specifications of the Vacuum Oil Company, which at this time began to mix and compound oils at the seaboard for large shipments abroad.[27]

Between 1905 and 1911 the increasing demand for naphtha products, especially motor gasoline, forced operatives at Bayonne to increase the yields of these commodities. About 1906 or 1907 the men had two alternatives—either to increase the number of rerun stills or to effect more efficient operation of the existing plant. They adopted the second by converting all their steam rerun stills to continuous operation and by installing vapor heat exchangers, in contrast to the oil heat exchangers utilized on crude stills. The new equipment was said to have been devised for the first time in the American industry by the manager of Bayonne's Number 2 Plant, B. H. Lepley. Vapor heat exchangers raised the temperature of ingoing distillate and simultaneously aided in condensing the heavier fractions of outgoing vapors.

In spite of these improvements, the question of gasoline production remained acute, particularly for refineries manufacturing for the foreign market. In 1910 top management designated Lepley and Henry C. Smart of the Pratt Refinery to investigate the whole subject and to make recommendations. They found inefficiency in several Standard Oil seaboard plants; in some almost no attention was being given to careful cooling and condensing and little was being accorded to recovery of gasoline from highly volatile fractions or to utilization of the dry gas for fuel, both of which Bayonne had been doing since the 1890's. In addition to strongly suggesting a general tightening up of efficiency, Smart and Lepley recommended that all plants adopt continuous operation of rerun stills, that the final boiling point be raised to 350° instead of 330° as formerly, and that continuous treating of naphthas be adopted. The latter step alone was estimated to have effected, when applied, a saving of at least 2 per cent over treating by batches in open agitators.[28]

Active as managers of Bayonne and other Standard Oil refiners were in expanding yields and volume of gasoline and naphtha products, they failed to answer the demands of European marketers for these commodities. As the detailed discussion in Chapter 17 shows, Standard Oil refiners were never able in this period to furnish as much naphtha as their foreign marketing associates desired. The Manufacturing Committee found several reasons for not providing the range of naphtha products demanded by European markets, especially the German. Furthermore, as

discussed later, other considerations motivated European merchandisers of Standard Oil products to buy some crude naphtha from outsiders and to invest in rerun plants in order to serve the particular needs of their markets for gasoline and naphtha.

Though full comparison with other refineries is impossible for lack of evidence, Bayonne men obviously effected many economies during the years under review. The dried top gases were piped from the stills for use as fuel elsewhere in the plant, including the Bergenport Chemical Works and the drying kilns of the wooden barrel factory. Mention has already been made of utilizing heat from flue gases in superheating steam and in both oil and vapor heat exchangers. Although most stills were hand-fired with coal, Bayonne's management used still coke, still gas, wax tailings (residue after pressing wax), and oil as supplementary fuels—wax tailings after 1908 and fuel oil extensively in 1909 and later.[29]

A catastrophe of major proportions induced management at Bayonne to adopt economies of another type—fire protection and fire prevention. After a $500,000 fire in May, 1900, at the canning shed and pier, on July 4 lightning struck two large tanks in the storage area. The flames spread rapidly and widely. Crude oil, distillates, and refined products went up in appalling clouds of black smoke. Not entirely extinguished for four days, the fire caused a loss of over a million dollars. Small wonder that the Pacific Coast Oil Company, building the Richmond plant in 1901-1902, placed its crude storage facilities five miles from the refinery and that Bayonne's books for the ensuing years showed increasing expenditures for higher fire walls between tanks, for placing tanks wider apart, and for fire-fighting equipment.[30]

Other economies resulted from public pressure. Although appropriation records indicate that the Standard Oil Company (New Jersey) began installing smoke consumers in 1899, inhabitants of Staten Island periodically complained about the acid fumes emanating from various installations on Constable Hook, especially from the plants of Tide Water, Columbia Oil, Standard Oil, the General Chemical Company, and the Orford Copper Company. On December 17, 1908, E. H. Porter, New York State Commissioner of Public Health, reported that the plants of the chemical company, the copper company, and Standard Oil units did emit objectionable, disagreeable, and injurious fumes which under certain atmospheric conditions annoyed, injured, and endangered "the comfort, repose, health and safety of a considerable number of persons in the County of Richmond" and constituted a public nuisance therein. To re-

move the stigma of public condemnation, Standard Oil officials hastened the adoption of Van Dyke tower stills, which eliminated the necessity of burning acid out of steamed coke after the use of the Frasch process, installed water scrubbers in the copper oxide roasting furnace to decrease the fumes discharged, and adopted a variety of other remedial measures. At the Bergenport Chemical Works they rebuilt the still chambers to check the amount of escaping gases, improved draft conditions on fuel burners, repaired all leaks quickly, and instituted rigid inspection. When the commissioner made his supplemental report on November 19 a year later, he expressed satisfaction that the company had taken every measure to obviate the noxious fumes that the state could reasonably expect.

While expanding still capacity and effecting economies in refining, managers at Bayonne paralleled this course in every other category of operations. Adding to old and buying new equipment for the paraffin works—rings, presses, chilling machines, and sweaters—was an annual occurrence. Similar changes were made in the glue and wooden-barrel factories, the case and can plant, the acid separating unit, and the Bergenport Chemical Works.

In fact, Bayonne contributed two of the few new auxiliary manufactures inaugurated by Standard Oil men during the first decade of the twentieth century. After purchasing a patent, they began the manufacture of steel barrels at "the Hook" in 1902, and six years later added the fabrication of steel drums, thus creating packages that leaked less than wooden containers, lasted longer, required less repair, and involved less fire risk. On several occasions executives contemplated the addition of manufacturing pipe fittings (tees, unions, valves, ells) to the operations of National Transit but decided against the idea. At one time some officials set off a proposal that Standard Oil should manufacture its own lamps, heaters, and stoves, but the Big Board decided to continue to rely upon outside producers. The Gilbert & Barker Manufacturing Company did embark upon a new product, its first gasoline pump, in 1910, and had it fully equipped with a measuring device within another year.[31]

Elsewhere within the Standard Oil family, aside from Bayonne and the Jersey Company, expansion and improvement went on. With few exceptions, all lubricating oil works and refining units manifested the same characteristics of growth. Standard Oil's auxiliary activities everywhere flourished and expanded. Several companies maintained lithographing plants, and the main printing establishment of the combination operated at Cleveland throughout the period. In the same city workmen assembled

tank wagons enhanced in efficiency by suggestions from field men at home and abroad. Near the Atlas Refinery in Buffalo much more efficacious tank cars were manufactured on the basis of a patent for an all-steel car issued to J. W. Van Dyke in 1900. The National Transit Company not only served most needs of Standard Oil units for engines, compressors, and all kinds of pumps but also fabricated the same line of products for trade outside the family. Similarly, the paint mill of New York Standard in Brooklyn, under the supervision of J. G. Newcomb, produced both powdered and oil-base paints for Standard Oil and increasingly numerous outside consumers. The same company maintained its plants for manufacturing wicks and shooks, but in 1904, for legal and administrative reasons, holdings of several companies in timberlands and all stave fabrication were vested in a new corporation—The Interstate Cooperage Company, under the presidency of Martin Snider. Jersey Standard contributed tracts of timber in West Virginia, for example, while Indiana Standard put in properties located in several states in the Misssissippi Valley. Case and can plants in Brooklyn, Philadelphia, and Richmond were more and more mechanized.[32] Evidence abounded to substantiate one observer's remark in 1907: "The Standard believes in buying nothing which it can make as well or better."[33]

The truth of the matter, however, is that Standard Oil bought more and more producers' goods outside the family. Expanded operations along old, familiar lines meant that Standard Oil plants bought more can-making machinery from the E. W. Bliss Company, more pipe and tubing from subsidiaries of United States Steel, more tin plate from the American Sheet Steel & Tin Plate Company, more barrel-making equipment from The Walsh Manufacturing Company, to name only a few suppliers. The number could be multiplied many times as mechanization of plants progressed.[34]

Appropriation records at Bayonne, for example, reveal a marked increase in the tempo of mechanization of all operations after 1899. Among the hundreds of new items were pneumatic hammers, steam hammers, planers, oil burners, compressors, chilling machines, air blast mechanisms, fans and engines, pipe-cutting machines, oxyacetylene welding and cutting equipment, locomotive cranes, locomotives, and automatic stokers. Paving of roads within the plant having been inaugurated in 1906, management luxuriated in its first automobile a year later. A motor launch, purchased at the same time, cost one thousand dollars, the car three times as much,

which may account for the delay in buying the first two motor trucks until 1910.

Standard Oil's reliance upon outsiders for a larger and larger percentage of its equipment paralleled the increasing number of outside contracts for construction work and the growth of standardization of equipment. The new refinery at Bayway well illustrated the latter tendency. In 1911 the plant's sixty-six Van Dyke tower stills were identical in design and equipment, as were the eight continuous rerun stills.[35]

Developments and trends of this period must of necessity be evaluated in the light of the type of evidence available and presented herein. Discovery of technological improvements did not necessarily mean acceptance of the new ideas in every unit of the Standard Oil combination. The information was passed around to everybody in responsible positions, but adoption depended upon many circumstances, two in particular. A new method of distillation of crude might not be applicable to the function assigned to a given plant. For example, continuous methods did not meet the needs of the Eagle Works, which often took off the Water White fractions with the aid of steam to prevent cracking because the maximum amount of residuum was desired for the manufacture of lubricants. On the other hand, the Sugar Creek Refinery utilized continuous distillation of crude because it was expected to maximize its yield of naphthas, kerosene, and fuel oil from Kansas and Oklahoma petroleum, though it did ship some distillates to Neodesha and Whiting. The second influencing factor in winning acceptance of a new idea at any plant was the superintendent and his working force. Although a very able man, C. R. Ewing could not make the Livingston method work satisfactorily at Baltimore with his available supply of skilled labor, while managers at Point Breeze, Bayonne, and elsewhere did succeed. Arguments as to the best methods of accomplishing given results were endemic in the refining business, as in almost every other type of manufacturing. Many of the "practical" refining men, who predominated in the plants of the period under review, looked askance at new ideas and scientific research.

QUALITY CONTROL AND RESEARCH

There is no doubt that the scientific approach to issues in the petroleum industry was winning more and more adherents throughout the first years of the twentieth century. Several lines of development can be discerned. One was through the empirical solution of specific problems, such as those processes and paraphernalia earlier evolved by Frasch for

deriving marketable kerosene from Lima-Indiana crude. Other men introduced technological changes in established processes and mechanisms in order to reduce costs. Another contribution to scientific method came through the inspection laboratory, which set the pattern for objectivity and accuracy and provided a jumping-off place for research. Lastly, in many academic and scientific institutions all over the world chemists primarily interested in the character and behavior of petroleum were piling up a body of information which provided the base for later more advanced methods.

In Standard Oil operations one path to industrial research was through the inspection laboratories of three refineries—Whiting, Point Richmond, and Bayonne. W. M. Burton, with a recent doctorate in chemistry from the Johns Hopkins University, started the central laboratory at Whiting upon his arrival in 1890. Preoccupied with inspection duties at first, he instituted research within a short time. E. A. Starke and his laboratory came into the Standard Oil combination with the Pacific Coast Oil Company in 1900. The central figure at the Bayonne Refinery was C. I. Robinson, who came from the Midwest in September, 1895. Prior to this time the plant had had no central inspection service; the Paraffin Works did its own testing of lubricants and waxes, and the Shipping Department checked on naphthas and kerosene. Within a month after his arrival, Robinson obtained an appropriation for a main laboratory and soon stocked it amply with the latest testing equipment.

Robinson's situation as a member of the Mechanical (maintenance) Department hampered the achievement of a truly centralized testing unit until 1899, when for the first time in the history of the refinery both Process and Mechanical departments were placed under the direction of the superintendent of refining. Not even then did Robinson exercise supervision over the quality of paraffin lubricants and waxes, as that department remained independent of the control of the refining superintendent many years thereafter. The chief chemist must have been persuasive, however, for his laboratory was testing lubricating oils and waxes by 1911, or earlier.[36]

Control of quality of manufactured products was the primary function of the laboratory at Bayonne, as elsewhere in 1899 and throughout the years to 1911. Every type of kerosene, naphtha, and lubricating oil had to be checked for specific gravity, flash point, color, pouring qualities, and viscosity. By 1911 or shortly thereafter the Bayonne laboratory was testing about 150 products. The wide range of local and national require-

ments as to testing instruments and flash points, discussed in earlier chapters, necessitated verification upon a different apparatus in many instances. Lamp tests to establish the burning qualities of the various types of kerosene were continually being run for forty-eight hours and longer. That not all the tests were very exact is indicated by the fact that far fewer checks were made at different stages of the refining process than today and that the color of lubricating oils was established by comparison with standard samples, the report merely stating "close, dark, or O.K." Offended by such generalized conclusions, Robinson invented a colorimeter. Neither he nor any other laboratory chemist, as far as has been ascertained, checked the work of the greasemakers in those early days. They controlled the quality of their own product literally by "rule of thumb," dipping that digit or another into the batch to estimate whether or not it came up to specifications.[37]

On foreign shipments controls at the refinery were supplemented by rigid tests made at 26 Broadway by technicians in George Saybolt's central laboratory. They received and checked the character of samples from separate tanks forwarded by the captain of each vessel loaded with Standard Oil products. Upon arrival at his destination the captain took another series of samples from the tanks, enclosed them in a locked case, and sent them to Saybolt immediately. Tests then revealed any deterioration of oil in the individual compartments of the tanker. When reports were unfavorable, both the manufacturing unit in the United States and the selling unit abroad were notified of the substandard character of the product.[38]

All-important as their responsibility was in assuring uniform quality of products to the consumer, inspectors could not but regard that task as routine and uninspiring in itself. Imaginative men turned to labors of a more experimental nature whenever opportunity offered. Saybolt patented not only many instruments but also the process of removing flocculent precipitate from kerosene by clay and one for extracting gasoline from natural gas. By 1900 at the latest, Robinson began to conduct experiments in a little shack back of the main testing laboratory at Bayonne. He and his one assistant sought to find methods of increasing the yields of kerosene and to determine the quality of illuminating oil obtainable from a variety of crude oils. "This was the first experiment recorded by the refinery laboratory," later remarked the assistant, Hugh H. Gallagher.[39]

The evolution of research facilities at Bayonne was given a fillip by the activities of Herman Frasch. From 1899 to 1905 he was under con-

tract with Standard Oil Company (New Jersey) as a part-time researcher for a salary of $8,000 a year. Doing his most effective work prior to 1904, Frasch tackled the general problems of refining Beaumont and Coalinga crude and also of maximizing the yield of commercial products from so-called Eclipse crude, which was really the slops not utilized by the plant of Atlantic Refining at Franklin. From 1900 to 1903 the expenditures for experiments at Bayonne ranged from approximately $5,200 to almost $15,000 annually.[40] Those outlays are reminiscent of the special charges for experiments on Lima-Indiana crude by numerous refineries in the late eighties.

The interests of J. E. Eggleston, superintendent of refining, coincided with those of Robinson and Frasch. In fact, he participated in some experiments and followed all closely. Two of the patents arising from the research and assigned to Jersey Standard were granted in his name. An important result of Eggleston's encouragement and approval was the erection of a small "experimental plant"[41] at Bayonne in the summer of 1904. Robinson soon received authority to engage a second chemist, E. B. Cobb. A special office in the plant for Saybolt permitted his effective participation in the program.

Patents assigned to Jersey Standard by the experimenters suggest that the company received a good return on its investment in salaries and plant. In 1900 Frasch applied for a patent, granted in 1907, on a process and apparatus for more effectively separating naphthas and gasoline from kerosene distillates. The mechanism involved the use of steam in the still and a fractionating column utilizing sievelike baffle plates instead of stone, as in the Van Dyke towers. Before the end of 1902 he had applied for patents on a process and apparatus for distilling and treating kerosene from Beaumont crude and on a treating process for Coalinga crude, apparently the one adopted by Pacific Coast Oil Company. Robinson first applied for a patent on an improved process for treating Beaumont crude in 1903, while Eggleston devised the apparatus. Both patents were granted in 1912. The two co-operated also on a method for more effective treating of Lima-Indiana petroleum in 1906 and 1907. Robinson later patented a method for better utilization of acid sludge.[42] The team of scientists had happily combined research and refining engineering.

Cobb made his most important contribution after 1911, though he had worked on the problem for three years before that date. In January, 1908, he began experimenting upon a method for manufacturing a white oil for human internal lubrication. Not until August, 1913, did he succeed in

devising a commercially feasible process for making the now widely known Nujol.[43]

Meanwhile, several other men in Jersey Standard and its Eastern affiliates had patented additions to refining technology. Among these were the following: by Oliver Shiner at Bayonne, a method for the continuous treating of gasoline and naphthas, just getting into effective use in 1911; by Richard Thomas, also of Bayonne, an improved chilling machine for paraffin-wax manufacture; by C. R. Ewing of the Baltimore plant, a technique for utilizing flue gases not only below the stills but also over the top; and by W. C. Koehler and Louis Link of Bayway, other improvements in distillation mechanisms. A number of the contributions of Livingston, Van Dyke, and Irish have been noted in connection with crude distillation; Atlantic Refining also had an able chemist in F. C. Robinson and an expert on treating in G. H. Taber, who left to join Gulf Refining in 1905. Henry C. Smart of the Pratt plant was a recognized authority on refining kerosene, naptha, and gasoline.[44]

In spite of the impressive record of the Eastern plants, there seems to have been general recognition that, especially between 1902 and 1907, the Whiting Refinery was the acknowledged center of research in petroleum chemistry, not only in the Standard Oil group but in the United States.[45] Operating under the general guidance of W. M. Burton, the leading figures there included R. E. Humphreys, George W. Gray, F. M. Rogers, R. H. Brownlee, and B. F. Carver. All holders of higher degrees in chemistry, these men constituted a team that devised methods for making asphalt products from plant sludges, worked out new methods of manufacturing road asphalts by oxidation, and set up new processes for producing greases and bloomless (nonfluorescent) oils, to mention only a few of the projects that were successful. The most famous result of the co-operation of the group was the pressure cracking process to maximize gasoline yields, patented in Burton's name in 1913, for which Humphreys as active head of the laboratory and research program justly claimed some credit. As discussed in the next volume of the *History of Standard Oil Company (New Jersey)*, the Burton-Humphreys method was the first cracking process for maximizing gasoline yields to win acceptance on a large scale in the petroleum industry, a fact which points not only to the growing demand for gasoline but also to the efficacy of Standard Oil's research activities prior to 1912.

These multitudinous activities within the Standard Oil family merely reflected the cumulative character and the remarkable advances in petro-

leum chemistry and engineering during the first decade of the century. Behind the success of Burton and Humphreys lay a record of scientific research dating back to work by Faraday in 1830 and by Berthelot in 1860, not to mention devices patented by Young, Dewar and Redwood, and others. In response to the expanding demand from motor vehicles, other men devised methods for cracking gasoline at almost the same time as Burton and Humphreys. The United States Patent Office was showered with applications upon all phases of petroleum manufacturing, while the technical literature of the period burgeoned with significant articles both on processes and on refinery engineering. Contributors of ideas and inventions were located in every important country in both hemispheres. Even registered formulae for new greases, probably the least scientifically manufactured of all petroleum products at this time, expanded by leaps and bounds. Researchers in the United States Bureau of Mines and C. F. Mabery of the Case School of Applied Science in Cleveland analyzed the character of American crude oils with a detail and an accuracy never previously approached.[46]

As alert businessmen should do, executives of Standard Oil continually checked upon the ideas and inventions of outsiders. As secretary of the Manufacturing Committeee for many years, Folger patiently answered suggestions and queries from hopeful inventors located in every quarter of the globe. Many were courteously dismissed without much ado, but not until 1903 did Folger's replies indicate a conviction that nothing better than the Frasch methods was going to be created for refining Lima-Indiana crude. Every question was subjected to the triple test of economy, effectiveness, and commercial possibilities. A batch of correspondence between Gifford, the general manager, and Eggleston, the superintendent of the Bayonne Refinery, for the years 1909-1911 reveals continuous checking of new patents and the comparison of new ideas with established methods in the plant.[47]

In fact, on many occasions Jersey Standard and its affiliates adopted methods devised by outsiders. The purchase of the patent for manufacturing steel barrels has been observed elsewhere. Several Standard Oil units manufactured asphalt by a process patented by F. X. Byerley, who in 1894 licensed Ohio Standard to use his method. Whether it was through carelessness or design is unknown, but some other companies in the family adopted the process without paying additional license fees. Byerley instituted suit for infringement of patent, which the separate corporations settled out of court.[48] A third example involved the treating of kerosene

from Coalinga crude oil. In order to manufacture efficiently the sulphuric anhydride used in treating kerosene derived from Coalinga crude oil, in 1903 Jersey Standard through the Bergenport Chemical Works agreed to pay fees for the use of a process owned by the Verein Chemischer Fabriken of Mannheim, Germany. Pacific Coast Oil immediately adopted the process in its acid works at the Point Richmond Refinery and also paid the fees.[49]

END PRODUCTS

Obviously, during the years from 1899 to 1911 Standard Oil executives at 26 Broadway had called upon the manufacturing interests in the combination to utilize a wide range of means to maintain or advance the position of the whole in the competitive race for markets and profits. The manufacturers had responded with vigor and no little imagination. They had erected eight new refineries in strategic locations and expanded selected established plants, instituted two new basic techniques for distilling crude petroleum, introduced continuous treating of refined products, and adjusted processes to various new crudes. In addition, they had retained all formerly operated auxiliary manufactures and begun several new ones, improved control over quality of finished commodities, encouraged many men to experiment upon new methods, started a research program in at least three separate refineries, carefully examined hundreds of new ideas submitted by outside inventors and adopted several of the techniques, effected many economies in operations, and participated in the general American tendency toward increased mechanization and standardization of plant.

Results in terms of maximum use of raw material, reduced costs per unit of manufactured product, and shift in yields cannot be evaluated with any satisfactory degree of exactitude. Complete data on manufacturing operations of Jersey Standard and all its affiliates are not available for the years under review. Loss of material in manufacturing, or the difference between the volume of crude run to the stills and the aggregate of finished products, manifested an actual increase at Bayonne; during the last six months of 1899 the loss in volume was 3.15 per cent for Lima-Indiana crude and 1.82 for Pennsylvania-grade oil, while the figure for sour crudes during the first half of 1911 was 3.79, for Sweet Western petroleum 3.34, and for K. T. Oil 2.69. However, Bayonne operatives had a much wider range of crude oils to process at the end of the period than

at the beginning. Other Standard Oil plants, concentrating upon one type of crude and one distilling technique, may well have made a better record.

A similar problem of evaluation arises with reference to so-called manufacturing costs—the cost of the actual manufacturing process. Bayonne Cost & Yield Statements reflected the rising costs of labor and equipment. To turn out a gallon of kerosene by the Frasch process during the first half of 1900 cost an estimated .3564 cents, while the figure for January to June, 1911, was .3858 cents. The average cost of processing a gallon of kerosene from Pennsylvania-grade petroleum in 1900 was .1261 cents less than for a gallon derived from Sweet Western crudes in 1911, but the two categories are not really comparable; the first crude was fairly uniform, the second a mixture. Refineries allotted the task of running one kind of crude, particularly a nonsulphurous type, undoubtedly offset the handicap of mounting costs still more. It is certainly true that had not new techniques and many economies been instituted, the manufacturing costs would have shown a much more noticeable increase than actually occurred.

In the shift in yields of various products as a result of new crudes and increased demand by consumers, Standard Oil's record necessarily closely paralleled that of the American petroleum industry as a whole. Plants of the combination were well located as to markets and with reference to all the varying types of crude oil then available in the United States. The main trends are shown in the data compiled by the Bureau of the Census for 1904 and 1909. During those years the percentage of illuminating oil taken from all crudes in the country declined from 48.2 per cent to 37.92, while naphthas and gasoline rose from 10.33 to 11.73 and fuel oil from 12.82 to 33.55.[50]

Without any doubt the Standard Oil combination offered to consumers a wider range of finished products than any other corporation in the American petroleum industry. Its very size and diversification of plants enabled it to cater to and to meet every existing type of demand. By 1911 Standard Oil marketers were offering more than forty naphtha and gasoline products to their trade, as compared with fifteen in 1883. The range of kerosenes produced changed little after the 1890's, but instead of the crude oil used for industrial fuel in the late eighties, Jersey Standard and its affiliates manufactured several types of fuel oil according to specifications of factories, railroads, steamships, and warships in the United States and abroad. A wide variety of trade specifications for gas

oil was met by Standard Oil, which was the overwhelming leader among manufacturers of that commodity.

Other products manufactured for sale by the Standard Oil combination seemed to have reached a point of minute differentiation and use in comparison with those of the early eighties. Lubricating oils, greases, wax, and candles are discussed in Chapter 16. In the period after 1899 Standard Oil probably made its most noteworthy additions to its line of products in asphalts and road oils. To meet the specifications of railroad companies and commissioners of highways in the Eastern United States, in 1911 Bayonne produced eight types of macadam binder and twenty-one kinds of asphalt, ranging in melting point from 105° to 285°. Acid sludge, once dumped at sea, went to manufacturers of fertilizers as a raw material. The American Agricultural Chemical Company purchased almost all the separated acid produced by Standard Oil units along the Atlantic Coast. Still ends or still tailings were being manufactured into pitch for weather-proofed pipe covering, for roofing material, and for similar uses before 1911. Some still coke, once all burned in the refineries, was sold as industrial and domestic fuel and for carbon points in the electrical industry.[51]

While making these many changes, Standard Oil managers had made their quota of errors in judgment on manufacturing problems. Herman Frasch, well aware of the use of the fractionating tower for the refining of cleaner's naphtha in Germany for many decades, drew up plans for its adaptation to Standard Oil's refining, but his idea was turned down in favor of the Van Dyke stone-packed tower. Had Frasch's method been successfully applied, the bubble tower might have appeared in the United States fifteen years earlier than it did. Meanwhile, Standard Oil executives were in hot water continually in connection with the growing demand for gasoline. By 1911 there was a supply in excess of demand on the Pacific Coast and an insufficient supply at Eastern plants for domestic and foreign markets. In the effort to meet the demand for gasoline, Standard Oil refineries were manufacturing more kerosene than the market would absorb; storage of illuminating oil thus became another problem.[52] Research on extracting more gasoline from available crudes had proceeded too slowly for Standard Oil to keep pace with increasing demand.

From almost any viewpoint, however, the achievements of the manufacturers within the Standard Oil combination during the early years of the twentieth century were impressive. From location of plant to control of quality of products they manifested a full measure of careful evaluation

of all factors to be considered. Managers were far from apathetic and strove hard to maintain their position in the competitive scramble. They improved their plant, techniques, and products. They greatly broadened the range of their products. To be sure, competitors from Pennsylvania to the Caucasus, in California and the Netherlands East Indies, were adopting similar methods and accomplishing much the same desired results. Accurate evaluation of relative contributions is impossible. Efforts to write the history of one company, such as Jersey Standard, even though it was the largest in the world's petroleum industry, only go to prove that no history of an individual corporation can be fully evaluated until others are available for reference and information. The same statement could be made about all phases of activity, including domestic and foreign marketing, the subject of the next group of chapters.

Chapter 15

Home Trade in the Twilight of the Kerosene Age 1899–1911

From 1899 to 1911 Standard Oil domestic marketers were pulled and pushed by conflicting forces in a market which was undergoing changes at a rate unparalleled since the beginning of the American petroleum industry. Sales of kerosene in the United States by the combination reached a peak soon after the turn of the century and then slowly retreated before the advent of substitutes for producing light and heat. Simultaneously, demand for such former by-products as gasoline and industrial fuel oil expanded by leaps and bounds. Competitors of Standard Oil grew in numbers and in strength, while day after day salesmen of the combination presented their wares to a public made suspicious, often actually hostile, by attacks on Jersey Standard and its affiliates in newspapers, periodicals, legislatures, and courts of the United States.

MARKETING ADMINISTRATORS AND THEIR INFLUENCE

The membership of the Domestic Trade Committee, which was charged with the responsibility for co-ordinating home trade, changed almost every year, too often for presentation of more than a few names here. Between 1899 and 1903 H. A. Hutchins and C. M. Coburn resigned, while Walter Jennings left the committee for the Big Board, as did L. J. Drake and H. M. Tilford at later dates. Among the leading members of the group in the later years of the period were T. J. Williams, head of Jersey Standard's domestic marketing, W. R. King in the same capacity for the Standard Oil Company of New York, and Charles M. Higgins, co-ordinator of sales of gas oil and fuel oil in the Eastern United States.[1]

These were the men who shared with the Executive Committee such control as was exercised over domestic marketing from 26 Broadway. From them emanated requests for reports on Standard Oil sales and on

activities of competitors. The approval of the Executive Committee was necessary for all expenditures over $5,000 and for increases in salaries of employees earning $600 or more per year in all domestic marketing companies. The Domestic Trade Committeemen were the ones who insisted on observance by all Standard Oil domestic salesmen of the detailed accounting rules incorporated in the manual entitled "Distribution of Expenses in connection with the Barrelling and Marketing Report and other rules in relation to Home Office Accounting," already in its fourth edition by 1904. All these measures were supplemented by a steady flow of suggestions and recommendations ranging the whole gamut of marketing techniques. By 1911 central control, always exercised through appropriate directors and officers of their respective corporations, was obviously far more extensive than in 1882 and somewhat stronger than in 1899.

Within the framework of policies and rules set by 26 Broadway, however, marketers in the field enjoyed a considerable area of autonomy. Most policies of top management were based upon information and suggestions dispatched from operating marketers, whose recommendations on price changes, expenditures for expansion, and salary increases were normally automatically approved at 26 Broadway. General managers in the field implemented policies as they saw fit; they exercised their own initiative in selecting sites and erecting new bulk stations, in operating tank wagons, in selling above minimum prices, in devising new sales techniques. Theoretically, and actually for the most part, each man was given enough freedom of action to display his abilities; the measures of his success were the volume of sales, the percentage of his potential market retained, the earnings of his unit, and the *esprit de corps* of his subordinates. Not until a man had fully demonstrated his inability to master a job was he displaced; occasionally the lag was perhaps longer than it should have been for the best interests of the organization.

The Waters-Pierce Oil Company constituted a special problem among the large Standard Oil wholesalers. The men at 26 Broadway never succeeded in controlling it, and, in spite of its high earnings, it always was a thorn in their flesh. Henry Clay Pierce was an aggressive individualist and could never be persuaded to work as a member of a team.

Difficulties with the Waters-Pierce Oil Company stemmed from the agreement between Standard Oil executives and Henry Clay Pierce at the inception of the corporation in 1878. According to the statements of Pierce, it was agreed at the time of the organization of the company that he should have the management of the business, in spite of the fact that he

held only a minority of the stock.[2] His aggressive tactics and extremely high profits concerned members of the Domestic Trade Committee from the early eighties onward, but Pierce rarely heeded their suggestions. Hence, executives at 26 Broadway often thought of buying him out and tried to do so on more than one occasion.[3]

Their agitation increased in the 1890's when the Waters-Pierce Oil Company came under the guns of antitrust laws in Texas. Officials in that state secured an indictment of Waters-Pierce as a violator of the state's antitrust legislation. After a series of trials and legal maneuverings, the company was ousted from Texas in 1900.

In conformity with that decision, the old corporation was dissolved and a new company bearing the same name was created. Pierce and Jersey Standard executives arranged a nominal, legal separation of Waters-Pierce from the parent; the latter's 2,747 shares, more than 68 per cent of the 4,000 issued, were transferred to the name of Pierce himself and later to other individuals. Accounts of New York Standard carried the "C. M. Pratt Investment," which showed the funds used by individuals to purchase the stock. Worn by age and hard work, Pierce nonetheless made himself chairman of the board of directors of the new company and saw to the election of his relatives as chief executives.

Until 1905 the Waters-Pierce Oil Company seemed a member in good standing of the Jersey Standard family. A director of Waters-Pierce, H. M. Tilford, participated in the activities of the Domestic Trade Committee, which made suggestions regarding the conduct of the business. Although addressed to 75 New Street, the back door of 26 Broadway, Waters-Pierce marketing reports, orders for supplies, accounts, and salary records continued to flow into Tilford's office.[4]

Actually, however, tension increased between Waters-Pierce and 26 Broadway. Managers of the Missouri corporation did not heed suggestions, annual dividends amounted to many times the total capitalization of the company, and activities in Mexico came to the attention of New York only after commitments had been made. In 1904 Standard Oil top management succeeded in persuading Waters-Pierce to accept as vice-president the former assistant treasurer of New York Standard, R. P. Tinsley.

Friction flared shortly into open conflict. Tinsley began to apply ideas derived from his mentors at 26 Broadway. He removed personnel long in the good graces of Pierce, replaced some of the long-standing employees with importations from the East, tightened accounting pro-

cedures, and undoubtedly listened more attentively than had Pierce to advice about conforming to state laws and narrowing profit margins. Dividends paid on Jersey Standard's 2,747 shares of stock of Waters-Pierce dropped from $1,853,700 in 1904 to $137,350 a year later.

Reducing prices and narrowing profit margins had become a matter of serious import by 1904. In Texas and Oklahoma, crude oil had begun to flow in impressive quantities. That situation had led to local refining and strong competition in Texas, and indications were that a similar development would soon occur in Oklahoma. The "good old days" of quasi-monopoly by the Waters-Pierce Oil Company belonged to the past, but the dynamic and stubborn Henry Clay Pierce insisted upon pursuing the same policies that had brought him pre-eminence and a fortune.

To him the behavior of Tinsley must have been shocking, indeed. Not only was the foreigner from New York destroying the confidence of customers in Pierce's field men of recognized ability, but Tinsley also was undermining the position which Pierce had maintained throughout his career—that he was independent of Standard Oil control, that he was not a member of the combination, and that his methods of doing business were justified in the various states. Pierce apparently felt that his creation was being taken from his hands and that his policies were being ridiculed before the public.

Coincidental with the growth of friction within the marketing organization, early in 1905 the State of Missouri initiated a suit charging Waters-Pierce, the Republic Oil Company, and Indiana Standard with violation of the local antitrust laws. This occurrence probably reconciled executives at 26 Broadway to a withdrawal of their influence over Waters-Pierce, though no evidence has been found to substantiate the assumption.

Asserting his prerogatives under the original agreement, Pierce removed Tinsley in the spring of 1905 and resumed direction of the affairs of Waters-Pierce in their entirety. After 1904 he sent few accounts or reports of any kind to 26 Broadway. Partly as a consequence of affiliation with Jersey Standard, a combination in violation of Texas antitrust laws, and partly as a consequence of Pierce's own disregard for the laws of the states in which he operated, Waters-Pierce became involved in so much litigation and had to pay such heavy fines and legal fees that it paid no dividends after 1908. During the next year, in fact, as a result of the decision ousting Waters-Pierce from Texas, the old warrior formed a new limited partnership association—the Pierce-Fordyce Oil Association—which conducted operations in Texas. In that partnership Jersey Standard had no

interest, though its stockholders retained their equity in the Waters-Pierce Oil Company.

Small wonder, then, that in the suit for the dissolution of the combination Jersey Standard's attorneys laughingly referred government counsel to Pierce for substantiation of their statement that the parent company did not control Waters-Pierce. Frustration at loss of profits and at inability to control the company later led J. A. Moffett to characterize the management as "very unsatisfactory," as "careless, extravagant and inefficient," and as "ineffective and not for the best interests of the stockholders."[5]

THE EVER-CHANGING MARKET

While endeavoring to keep all marketers working in "the general interest," Standard Oil top managers had to try to keep pace with a rapidly changing market for petroleum products. Since marketers of the combination sold every type of petroleum derivative throughout the entire home-trade area, they had to face all the changes in demand, no matter how variable those might be for particular commodities in different regions. Maintenance of over-all profits depended on successful adjustments to a host of disturbing factors both inside and outside the petroleum industry proper.

As a generator of energy, petroleum was an "also-ran" throughout the years under review. Well buttressed by comparatively low costs, for another generation coal remained the prime material for the production of heat and power in hotels, offices, and plants. From 1899 to 1909 the contribution of coal to the total energy production of the United States declined merely from 89.1 per cent to 85.1 per cent, while petroleum's share was rising from a low of 4.5 to an unimpressive peak of 7.7.[6]

Enterprising businessmen also steadily manufactured and sold an expanding volume of artificial gas for illuminating purposes. Although their method utilized some gas oil, their product competed with both natural gas and kerosene. The number of establishments manufacturing gas by the coal, water, or calcium-carbide methods grew from 877 in 1899 to 1,296 ten years later. At the same time the production in millions of cubic feet rose from 67,094 to 150,836. Artificial gas enjoyed several advantages over natural gas: manufacturers of the artificial product could locate in municipalities which provided the market, while natural gas usually had to be piped long distances; historically, producers of artificial gas had preceded distributors of natural gas and had firmly entrenched themselves with local politicians. Hence, natural gas was sold primarily to industrial users. How-

ever, the high price of artificial gas restricted sales to the homes of the relatively well-to-do, though the average retail price for the United States dropped from $1.04 to $0.86 per thousand cubic feet between 1899 and 1909. Thus, the area of inexpensive lighting in most places was left to competition between kerosene and electricity.

Producers and distributors of electricity proved to be extremely strong competitors of Standard Oil and other sellers of kerosene. By the twentieth century the successors and emulators of Thomas A. Edison had improved the management of their operations and had made marked advances in the technology of generation and transmittal of electric current compared with that of the early days of the industry. Electricity was safer than kerosene and cheaper than any other illuminant, after the costs of initial installation were written off. In spite of flickering filaments, the multiple advantages of electricity for lighting homes, offices, hotels, and plants (even refineries) made it relatively easy to expand the number of consumers (meters on consumption circuits) from 582,689 in 1902 to 3,837,518 within ten years. Standard Oil sales of kerosene in the United States declined in volume after 1903;[7] the trade shriveled under the ruthless glare of the electric lights, and marketers of the time could take no comfort in the fact that kerosene sales were to rise again after 1911.

Competitors of Jersey Standard within the petroleum industry multiplied in numbers and grew in strength. The opening of new producing areas in Illinois, Kansas, Oklahoma, Texas, and California induced scores of individuals, partnerships, and corporations to enter upon producing, manufacturing, and marketing operations. Many of them catered primarily to the expanding demand for industrial fuel oil, while others centered their major interest upon making and selling either gasoline or asphalt products and road oils. Refiners of Pennsylvania-grade petroleum tended to emphasize lubricants. Such established companies as Sun Oil, Pure Oil, and Union Oil, and such new ones as Indian Refining, Gulf Refining, and Texas became strong integrated units, while hundreds of smaller concerns vigorously sought to achieve stature in marketing petroleum products of all kinds.

Just at the end of the period under review Standard Oil marketers began also to feel more strongly the impact of foreign competition. The tariff act of 1909 left all petroleum products except residuum and tar totally unprotected for the first time in the history of the American industry. Only small amounts of paraffin wax and naphtha had surmounted the walls erected through countervailing duties prior to 1909, but after that date

both products began to enter in noticeable, though scarcely menacing, amounts. The value of wax imported into the United States from Scotch shale processors, Galicia, and other parts of Europe rose from $186,182 in 1907 to $1,025,829 three years later and for the fiscal year ending on June 30, 1911, the volume of imported naphtha (39,000,000 gallons) was more than five times as great as the amount entering during the year immediately preceding the removal of protection. The new tariff policy, coupled with cessation of demand for Sumatran gasoline by California Standard in 1910 and the possibility of the dissolution of the Standard Oil combination, undoubtedly contributed to the decision of Royal Dutch–Shell to come into the American market in 1912.[8]

More important to Standard Oil salesmen than the removal of almost all petroleum products from tariff protection was the restrictive character of the public attitude toward the combination after 1903. The proliferation of inspection legislation in various states,[9] as well as the passage and application of antitrust and one-price laws, complicated the operations of marketers and necessitated modification of existing practices. In dispensing products tank-wagon salesmen often met insurmountable antagonism to the Standard Oil "trust" which had been generated among millions of customers by the incessant drumfire of attack in the press, legislative halls, and courts of the land. Many salesmen, not responsible themselves for the existence of the mighty combination, must have felt that the opposition to the purchase of Standard Oil products deriving from antitrust sentiment was unfairly burdensome and altogether too favorable to competitors.

More than offsetting impediments and deterrents was the existence of a seller's market throughout the years from 1899 to 1911. Promising good profit margins and prosperity, the general price level moved irregularly upward. Setbacks were short-lived. A mounting population, accelerated by the greatest immigration in the nation's history, assured a steady and rising demand for heat, light, and energy in the homes, offices, hotels, mills, and factories of the United States. Urban areas, the largest markets for petroleum products, grew even more rapidly than the population as a whole. An industrial complex, seemingly bursting its seams in its rate of adolescent growth, relied for its very existence upon petroleum lubricants and insistently demanded inexpensive fuel as a generator of power in both stationary and automotive mechanisms.

When Texas and California crudes began to flow in currently awe-inspiring quantities after 1900, the character of the petroleum and the

inexpensiveness of production made them strong competitors of coal as industrial fuel, in many instances even when supplies were relatively remote from markets. Many observers thought that the Fuel Oil Age had arrived. The consequent growth in the amount of oil consumed as fuel impressed oilmen and the oil press so much that they tended to forget that the consumption of coal expanded at almost as rapid a rate as that of petroleum. Ushered in by the fabulous Spindletop well in 1901, Beaumont crude gave a marked impetus to the use of oil as fuel for plants, marine engines, and locomotives, but it built upon the market erected earlier by Standard Oil in the Middle West and East and by Doheny, Union Oil, and others on the West Coast. When supplies at Beaumont dwindled in less than seven years, California crudes and residuum from plants east of the Rockies grew in volume and importance in the fuel oil market. The outstanding new customer was the United States Navy, which in 1911 purchased fifteen million barrels of oil for nineteen oil-burning torpedo-boat destroyers and for eight battleships using petroleum products as an auxiliary fuel.

A more spectacular phase of the seller's market was provided by the invention and development of automotive vehicles. The number of registered automobiles rose from 800 in 1898 to 618,727 in 1911 and that of registered trucks at a slightly slower rate. Most of these burned gasoline in internal-combustion engines, but even the Stanley steamer used it as fuel under the boilers, and all automotive vehicles required petroleum lubricants. Standard Oil's sales of naphtha and gasoline in the United States gradually moved up until they exceeded those for kerosene in 1911.[10] Meanwhile municipal, state, and federal agencies, building on experience gained as a result of the urgings of the League of American Wheelmen, swung into road construction programs demanding many types of road oils, asphalts, and macadam binders.

Divine Providence surely smiled upon the petroleum industry. As the demand for kerosene declined, Standard Oil and its competitors found that their productive and distributive mechanism enabled them to reap profits arising from innovations in automotive propulsion developed quite outside their own immediate field of endeavor.

MINIMIZING TRANSPORTATION COSTS

For moving petroleum products to the ever-changing market, Standard Oil managers continued their practice of seeking the least expensive means. They explored and utilized every avenue available at the time.

The new refineries in the Mississippi Valley and on the Pacific Coast, erected in part at the instance of marketers, changed the supply pattern for several areas and materially shortened the routes from plant to consumer. By 1911, Kentucky Standard was purchasing increasing amounts of its supplies from North Alton and Baton Rouge, though still relying to some extent on Whiting and the Atlantic Coast refineries, as in 1898. The construction of the North Alton and Sugar Creek plants markedly reduced mileage on many shipments of refined products within Indiana Standard's own marketing territories. The last-named refinery, along with those at Corsicana and Chaison in Texas, largely supplanted Whiting as supply points for the Continental Oil Company, as did Point Richmond and El Segundo for products destined for the West Coast market.[11] In the search for lower transportation costs Standard Oil managers dispersed their refineries rather than concentrated them.

When competing refiners could and would sell refined or semirefined products at acceptable figures, Standard Oil's domestic marketers had no hesitancy in buying supplies from them. Although the arrangements of Iowa Standard and the Pacific Coast Oil Company with competitors terminated in 1906, elsewhere in the country other Standard Oil units continued purchasing from outside firms throughout the period under review. During the five years from 1906 to 1910, for example, deliveries of kerosene from competitors to Standard Oil marketers averaged 503,850 barrels of 42 gallons annually and reached their peak of 8.2 per cent of the total sales of the combination in 1907, declining to 1.8 per cent three years later. Comparable figures for naphtha and gasoline, exclusive of gas naphtha, were 602,339 barrels per annum, 11.6 per cent of total sales in 1908, and 7 per cent two years later. Tide Water supplied 15 per cent of competitors' deliveries of kerosene to Standard Oil and 58 per cent of naphtha and gasoline.[12]

Given existing circumstances, both buyer and seller gained from the arrangement. Purchasing from outsiders provided needed sources of supplies (particularly gasoline) for Standard Oil and aided marketers in maintaining their desired percentage of sales. The buying practice also kept competitors from attempting to take over a greater portion of domestic trade and reduced the possibilities of demoralization of the market by price cutting. On their part, competitors sold their refined products to Standard Oil because they could make a profit. They often received crude oil supplies as a part of the bargain and were not obligated to make large expenditures for marketing facilities to compete with the combination.

To keep the cost of delivering refined products at a minimum and to make a profit in the process, Standard Oil companies expanded their use of water transport after 1899. As noted in Chapter 14, almost all refineries of the combination were located on water routes. California Standard, Atlantic Refining, Jersey Standard, and New York Standard all increased their fleets of harbor and coastal craft. The Imperial Oil Company, Limited, began operating three barges on the Great Lakes in 1899, one tug a year later, a small tanker in 1902, and a larger one eight years later. On the same bodies of water were three barges and two small tankers owned by New York Standard. Its Lighterage Department, which managed all its marine transport, showed earnings ranging from a low of $525,070 in 1904 to a high of $1,069,782 in 1910.[13]

Executives at 26 Broadway decided against using long-distance pipelines to transport refined products. The trunk pipelines were designed to handle crude oil and were always fully occupied with that task. Only on such short local hauls as those from Bayonne to Brooklyn, from East St. Louis to St. Louis, and from Chaison to Sabine were refined products sent through special pipes.[14]

Meanwhile, Howard Page and Henry E. Felton successively managed the tank cars of the combination in a way to make that method of delivering petroleum products strongly competitive to water transport. The Imperial Oil Company, Limited, began to create its own tank-car fleet in 1899 and owned 142 cars within a year. The number of tank cars owned by Standard Oil units in the United States rose from 6,213 on January 1, 1899, to 10,594 nine years later; this growth was reflected in the increase of capitalization of the Union Tank Line Company from $3,500,000 to $12,000,000 in 1908. As a result of low rates and increased costs, the company paid no dividends from 1891 onward, and its net assets at the beginning of 1911 stood at $2,260,500 less than the capitalization of the corporation.[15] In effect, by operating at a loss, Jersey Standard's wholly owned Union Tank Line was paying a subsidy to Standard Oil marketers.

Wherever shipments had to be made overland, executives of Standard Oil marketing companies continued their former practice of seeking the lowest possible legal rates on railroads. Men in the traffic departments of the various marketing agencies meticulously examined every law, administrative decision, and railroad schedule pertaining to the hauling of petroleum products. Whenever they could do so, executives persuaded general freight agents of the railroads to set special commodity rates on refined oils, especially on intrastate shipments. Standard Oil units took

no rebates but tried to overlook no loopholes in existing laws, both before and after the passage of the Elkins and Hepburn acts in 1903 and 1906, respectively. As a consequence, marketers of Standard Oil products received low intrastate rates in some areas and special interstate rates between points where only oil shipments of the combination were extensively involved. Some companies also enjoyed the short-run advantages of blind billing (no stipulated rate on waybills) and low rental for land on which storage tanks were built and to which spur tracks were laid by the railroads.[16] Many shippers followed the same course of action, but few attacked the problem of keeping transport costs low so systematically and assiduously as Standard Oil men.

As the voluminous extant legal records for the period 1898-1911 abundantly prove, Standard Oil's top managers never ventured down a path labeled illegal by either Dodd or Elliott and never adopted a course of action with regard to railroad relations without consulting the lawyers. Evidence in the same historical materials and in many legal cases indicates that marketing executives also sought the advice of special counsel on particular shipping problems in their respective areas.

If the record of the courts may be taken as the criterion, Standard Oil counsel did a good, though not perfect, job of steering marketers on courses within the letter of the law on interstate commerce. Imperial Oil enjoyed preferential treatment, though no rebates, on the Grand Trunk and Canadian Pacific railways in Ontario and Quebec from 1898 to 1900, when public outcry and governmental investigation stopped the practice. By 1910 New York Standard had been convicted of violating the law, together with the railroads involved, for combining the "sum of the locals" in the state of New York with a low rate on a short interstate haul for shipments from Olean to Burlington and Rutland, Vermont. Far more important than either of these episodes, however, was the fact that Indiana Standard, serving a vast territory in the Mississippi Valley, in two celebrated cases successfully defended the legality of its relations with the railroads.[17] And these were the major interstate commerce suits instituted and prosecuted by the Department of Justice against members of the Standard Oil family.

Not to be ignored in evaluating the importance of Standard Oil relations with the railroads of North America is the fact that petroleum products did not loom large in the entire tonnage carried. During the year ending June 30, 1904, the total amount of petroleum and other oils hauled by railroads in the United States amounted to 4,809,349 tons, which scarcely

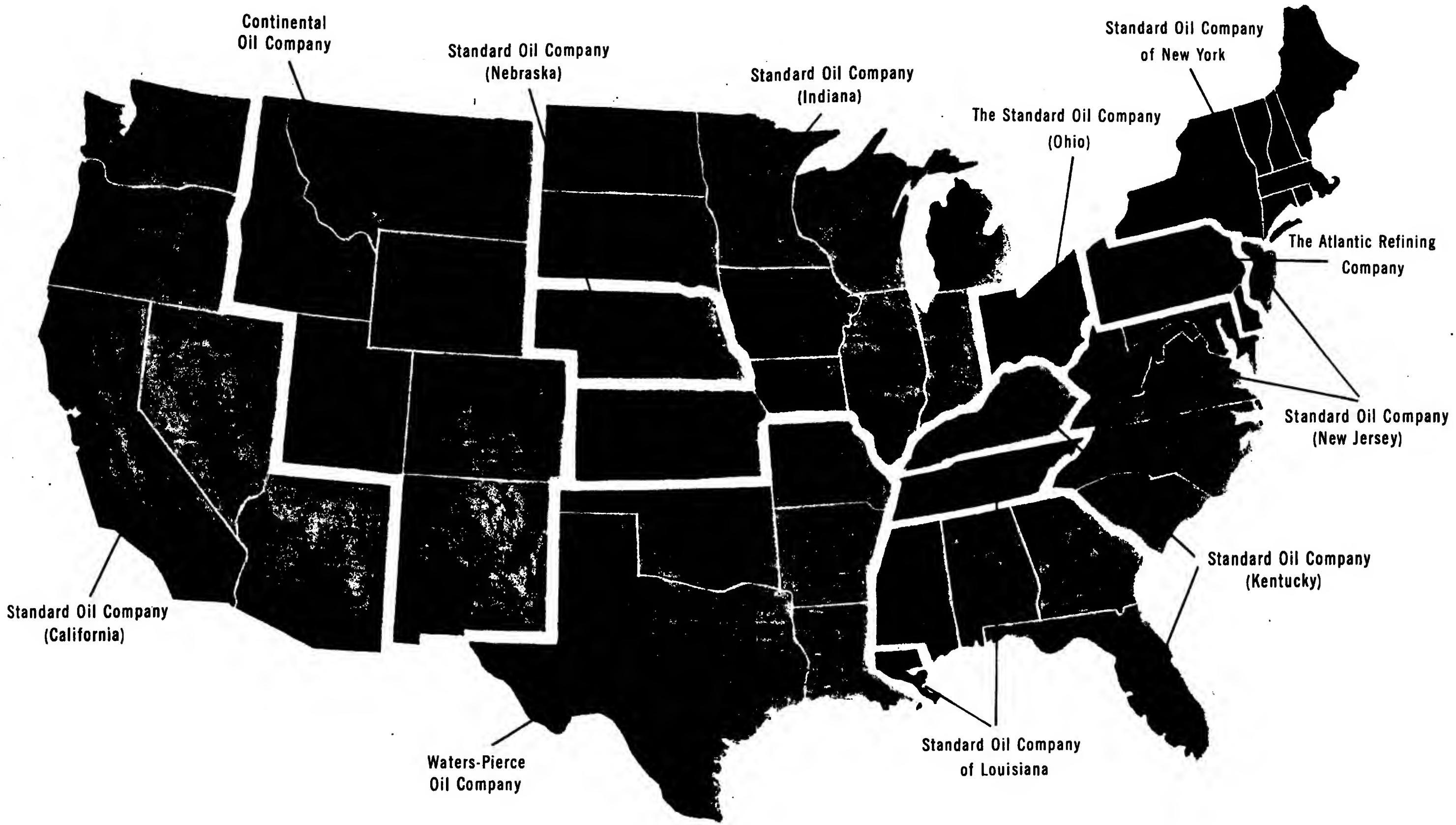
bore comparison with the 247,866,902 tons of coal and coke for the same period. Of the total oils shipped, Standard Oil units forwarded 2,690,015 tons between competitive points; that amount constituted only 0.42 per cent of the entire tonnage—641,680,547—transferred by railroads during the year.[18]

Furthermore, the behavior of Standard Oil marketers with reference to the railways of the United States and Canada was typical, not atypical. Thousands of shippers and scores of commodities followed the same practices as Standard Oil men. The Chicago & Alton Railroad alone had 386 different commodity rates in effect during 1903.[19] Traffic managers of Standard Oil companies may have been responsible for persuading general freight agents to issue special schedules on petroleum, but certainly they had no influence in shaping the rates on other types of goods. Shippers and railroad men alike pursued the course of obeying only the letter of the law as long as the Interstate Commerce Commission lacked any power over intrastate rates, did not force both parties to abandon secret and evasive tactics, and adopted a punitive attitude rather than one of constructive criticism leading to a national railroad transport policy.

The net result of the effort to keep down the transportation costs on refined products from plant to main bulk stations cannot be determined with any degree of exactness. Since refineries were more dispersed and nearer the markets in 1911 than in 1899, the hauls were shorter and costs consequently tended to be lower. Special arrangements with railroads also worked to keep costs low, as did reliance on water haulage and on extremely low charges for the use of Union Tank Line cars. On the other hand, voluntary and involuntary abandonment of semisecret intrastate and interstate tariffs by railroad companies resulted in higher costs to Standard Oil marketers. The fine paid by New York Standard in connection with its conviction for violating the interstate commerce laws on shipments in New York and Vermont could also be assessed to shipping costs, as could the expenses for the successful defense by Indiana Standard of its relations with the railroads in the Middle West.

EXTENDING AND MODIFYING MARKETING METHODS

One thing is certain. The new situation in transport, plus a variety of other factors, induced officials of the combination to rely more and more on the energy and ingenuity of their organized army of sellers throughout North America. Motivated by public pressure, desires to reduce costs and



Marketing Territories of Standard Oil Units in the United States, 1911

enhance profits, success with the established system, competition, and ambition, Standard Oil marketers retained and extended much of their inherited selling mechanism while making changes in some parts of it.

Chiefly as a result of investigations by the Bureau of Corporations and threatened or actual litigation, Archbold and his associates made several changes in the allocation of marketing territories among companies in the combination after 1898. As shown by the map opposite and by Table 40, by the end of 1906 all Standard Oil marketing companies except Waters-Pierce and Indiana Standard had their territories limited to specific states. Even those two shared only one state—Missouri. Nebraska Standard was created to market in the state of domicile as a result of litigation. From 1906 to 1911 Jersey Standard had the exclusive right among Standard Oil companies to operate stations in New Jersey, Maryland, West Virginia, Virginia, North Carolina, and South Carolina. At some unascertained date Delaware had been transferred to Atlantic Refining's marketing territory. The reallocation of 1906 enabled Standard Oil counsel in the suit for the breakup of the combination to argue that almost none of the products delivered to main distributing points entered interstate commerce thereafter.

The pattern of administrative organization for all marketing territories remained about the same in 1911 as in 1899, but the emergence of new leaders, the growth in the size of the market and of the sales force, and conditions peculiar to the sale of each product led to slight changes from time to time. The appointment of T. J. Williams as head of domestic marketing for Jersey Standard is a case in point, and the consolidation of different units of the Baltimore Division under one roof in 1910 is another. Sales of kerosene, gasoline, gas oil, gas naphtha, and fuel oil to governmental agencies and industrial consumers in the "smokestack trade" continued to be made by departmental heads at 26 Broadway or by such local executives as Thomas Goodwillie, head of Jersey Standard's Baltimore Division.[20]

Having located their main bulk-storage plants strategically prior to 1899, Standard Oil men thereafter concentrated their efforts on the erection of substations. Some main stations were expanded as business grew, and maintenance was a daily consideration. Meanwhile, the number of substations increased rapidly. By 1908 Standard Oil marketers, exclusive of Waters-Pierce, were operating 64 main depots and 3,178 substations in the United States, a total of 3,242. Of that number 2,552 had been established or acquired since July 1, 1890, and of those the Standard Oil companies had themselves constructed all but 16. By 1908 Jersey Standard

Table 40 CHANGES IN TERRITORIES ALLOCATED TO LEADING STANDARD OIL DOMESTIC MARKETING COMPANIES, 1899-1911

	Transfers of Territory	
Company	*Sold to*	*Bought from*
Atlantic Refining Co., The	1906—Jersey Standard—some of West Virginia and Maryland	
Continental Oil Co.		1906—Standard Oil Co. (Iowa)—western Montana and Idaho
Standard Oil Co. (California)		1906—Standard Oil Co. (Iowa)—California, Oregon, Washington, Arizona, Nevada, Alaska, Northwest Territories, and Hawaii
Standard Oil Co. (Indiana)	1906—Standard Oil Co. (Neb.)—Nebraska	1906—Standard Oil Co. (Ky.)—southern Illinois, southern Indiana 1906—Republic Oil Co.—Illinois, Indiana, Missouri, Iowa, and Nebraska 1899—The Standard Oil Co. (Ohio)—northern Indiana and southern Michigan
Standard Oil Co. (Iowa)	1906—Standard Oil Co. (Cal.)—Oregon, California, Alaska, Washington, Arizona, Nevada, Northwest Territories, and Hawaii 1906—Continental Oil Co. —western Montana and Idaho	
Standard Oil Co. (Kentucky)	1906—Jersey Standard—western South Carolina 1906—Standard Oil Co. (Ind.)—southern Indiana and southern Illinois 1906—The Standard Oil Co. (Ohio)—southwestern Ohio 1909—Standard Oil Co. of La.—eastern Louisiana 1910—Standard Oil Co. of La.—Tennessee	1906—Jersey Standard—Georgia and Florida
Standard Oil Co. of Louisiana		1909—Standard Oil Co. (Ky.)—eastern Louisiana 1910—Standard Oil Co. (Ky.)—Tennessee

Table 40 (Continued)

Company	Transfers of Territory: Sold to	Transfers of Territory: Bought from
Standard Oil Co. (Nebraska)		1906—Standard Oil Co. (Ind.)—Nebraska
Standard Oil Co. (New Jersey)	1906—Standard Oil Co. (Ky.)—Georgia and Florida	1906—Standard Oil Co. (Ky.)—western South Carolina 1906—The Standard Oil Co. (Ohio)—West Virginia 1906—The Atlantic Refining Co.—West Virginia and western Maryland
Standard Oil Co. (Ohio), The	1899—Standard Oil Co. (Ind.)—northern Indiana and southern Michigan 1906—Jersey Standard—West Virginia	1906—Standard Oil Co. (Ky.)—southwestern Ohio

Source: SONJ, accounts of various companies and salary records, 1899-1911; Taylor, "History," 94-97, 187-188, 193-194, 199-200, 232-233, and 235-238.

directly owned and operated 7 main stations and 364 smaller ones; since July 1, 1890, 302 stations had been established in its territory, all by Standard Oil men.[21]

Managers of main stations still stocked any commodity which they thought might aid in selling petroleum products to retailers and housewives; "one-man stations" concentrated on kerosene and gasoline but offered heating and lighting devices at very low cost. In addition to kerosene, gasoline, and petroleum lubricants, inventories at main depots also included such "petroleum merchandise" as candles, axle grease, crude and refined paraffin wax, petrolatum, sewing-machine oil, oils for casters, harness, belts, harvesters, and hoofs, floor dressing, and many other specialties. "Outside oils" embraced linseed, cottonseed, fish, whale, sperm, seal, porpoise, neat's foot, lard, tallow, colza, and rapeseed. Some of the "miscellaneous" items were fuel oil, gas oil, pine tar, pitch, lime, rosin, white lead, cans, tanks, wicks, candelabra, candle shades, lamps, stoves, and heaters. Both turpentine and "mineral turps" were also available.[22]

The manufacture of oil-burning instruments, which Standard Oil marketers distributed on extremely low profit margins to encourage sales of petroleum products, remained in "outside" hands. Many lamps and burners, sold under the brand names of "Perfection" and "Sterling," came from the Scovill Manufacturing Company and Edward Miller & Sons of Connecticut, the Manhattan Brass Company of New York City, and the

Cleveland Foundry Company. In 1906 Jersey Standard did register the trade-mark "Rayo" for a special lamp with a round wick made by Miller & Sons. Standard Oil's total sales of burning devices amounted to 485,000 items in 1902. T. J. Williams estimated that five times as many could have been distributed in that year had he been able to get deliveries from manufacturers unwilling to enlarge their plants. He recommended that the Cleveland Foundry Company should be purchased and enlarged, but there is no evidence that top management heeded his advice.[23]

Standard Oil salesmen relied heavily upon brand names and trade-marks before and after 1898. Some had long been associated in the public mind with products of uniform quality, among them being "Aladdin Security Oil" of Jersey Standard, "Eupion, The Family Safety Oil" inherited by Waters-Pierce from J. A. Finlay & Company, which began using it in the 1860's, "Pratt's Astral Oil," and "Elaine" kerosene, a brand originally owned by Warden & Oxnard, an early Pittsburgh firm.[24]

To enhance the appeal of brand names and trade-marks, Standard Oil managers gradually expanded their advertising activity and moved toward co-ordination of efforts in this line just before the combination was dismembered. A striking geological display and samples of all Standard Oil products were features of the St. Louis exhibition in 1904. Standard Oil got considerable publicity when it set up supply stations for the automobile race from Times Square to Paris via Bering Strait arranged by *Le Matin* and *The New York Times* in 1907. Trade periodicals continued to be the chief media for Standard Oil advertisements, though the "slick" ladies' magazines carried more and more appeals to the housewife regarding lamps, heaters, cooking stoves, and other burning devices. Expenditures of different companies for advertising grew annually, and the desirability of handling the whole as one effort under advice from a central office resulted in the creation of an advertising staff unit on the salary roll of New York Standard in 1910. The head was H. K. McCann, later founder of the modern advertising agency of McCann-Erickson, Inc.[25]

As important as any other means in winning and retaining customers were assurance of supply and constant alertness to the needs of both established and potential consumers. Perhaps that feature in the success of Jersey Standard's marketing was no better illustrated than at Kitty Hawk in 1903. There the motor of the aeroplane of the Wright brothers, in the first successful flight of a heavier-than-air machine, burned gasoline from wooden barrels and used lubricants in cans brought to the beach by Standard Oil salesmen.[26]

Tank-wagon drivers often won the confidence of buyers by "tricks of the trade," known early in the century as well as now. For example, in making burning tests comparing Standard Oil kerosene with that of competitors, whenever possible drivers selected an old chimney for their own lamp and assigned a new one to the competitor's oil, as new chimneys "smoked up" more quickly than used ones.

Affability, amiability, and the clever retort, then as now, got and kept customers for Standard Oil as well as for any other selling organization. Louis Blaustein, trouble-shooter on tank-wagon sales in the Baltimore Division and later founder of the American Oil Company, retained customers and won new ones by countering queries about the Standard Oil Trust with the remark that he was talking with them about oil, not trusts, and by smilingly adding, as far as independence was concerned, "The Standard Oil Company are the only independent people in the oil business."[27]

When the roads became good enough and the volume of trade justified the expenditure, marketers ventured to buy automotive tank trucks. By 1911 a few of these were chugging over Standard Oil routes, particularly those from refineries to main storage depots. Delivery by truck assured regularity of supply and quicker response in emergencies, not to mention much increased mileage covered daily, possible reduction in the number of drivers, and lower costs of delivery per gallon. But horse-drawn vehicles were not eliminated until the 1920's.

To deliver kerosene and gasoline to retailers, Standard Oil marketers varied the instrument according to the conditions encountered. In remote and mountainous areas where the packages were likely to be quickly damaged beyond repair, the goods were sent in cans and wooden barrels for which retailers were charged full price. Not inconsiderable amounts of kerosene, gasoline, and lubricants went to retailers and consumers in drums and steel barrels, many of the last-named being made at Bayonne; in most instances the customer did not pay for these packages, since they were normally returned in condition to be repaired. To the storekeepers' receptacles most tank-wagon drivers continued to transfer much gasoline and kerosene in the five-gallon "milk cans." Meanwhile, along with a remarkable growth in total sales of kerosene and gasoline, the percentage delivered to retailers in the United States by tank wagon rose steadily from 59 in 1899 to 70 in 1906, the last year for which statistical data are available.[28]

In both Canada and Mexico, Standard Oil techniques of distribution

conformed to the general pattern established in the United States. A subsidiary of Imperial Oil, The Queen City Oil Company, Limited, introduced tank-wagon deliveries in Toronto in 1899—the first in Canada—but steel barrels and drums continued to be used by both consumers and retailers in the numerous sparsely settled sections of the country. Imperial's bulk stations west of Lake Superior grew from 6 in 1904 to 120 seven years later, however. Beginning in 1900, sales of fuel oil and gas oil were pushed vigorously. South of the Rio Grande, distributive methods centered on barrels, drums, pushcarts, two-wheeled carts, and cans rather than tank wagons. Between 1899 and 1911 Waters-Pierce erected a can factory at Guaymas on the Pacific Coast. During these years the chief source of supply for Waters-Pierce marketers came to be the Tampico Refinery which, expanded to a reported thirty-two stills, refined distillate from Atlantic Refining, some crude produced by Waters-Pierce wells on the Panuco River, some Texas petroleum, and some purchased from E. L. Doheny's Huasteca Petroleum Company. By the end of the period H. C. Pierce was leading his firm in a cutthroat price war with the integrated "el Aguila" company operated by Pearson & Son of Great Britain and was fighting the breaking of his monopoly of the Mexican market by publishing in the newspapers not only defenses of his own actions but pronunciamentos on those of his rival.[29]

Standard Oil men also improved and adopted other devices and techniques to forward sales of petroleum products. Long before 1911 the tank wagons assembled by Ohio Standard at Cleveland were almost completely made of steel. Gilbert & Barker expanded the manufacture of industrial fuel oil burners and storage tanks. In 1910 it brought out its first curb pump for retailers of gasoline and within a year offered an improved version with a measuring device. Since Standard Oil did not normally engage in retailing gasoline to motorists, the marketing companies made few contributions to the evolution of the modern drive-in service station. There were some exceptions, however: one was the case in Seattle mentioned in Chapter 12; although all Canada boasted only 21,783 registered motor vehicles using gasoline in 1911, Imperial Oil could also claim that its representative in Vancouver had introduced one of the earliest of the new service stations in 1908. During the last years of the decade Indiana Standard began delivering gasoline and kerosene to farmers along the routes of tank-wagon men between towns.[30]

Probably far more significant in maintaining sales of kerosene than the deliveries to farmers was the embarking of Standard Oil marketers upon

large-scale peddling of the product in cans from door to door. Using the experience gained in house-to-house canvassing in Long Island City and Brooklyn after the acquisition of the Mehlen's Family Oil Company in 1889, domestic marketers of the combination plunged into peddling on a large scale during the years 1900-1902. Since only cities were selected for such operations, the activity was largely concentrated in the region north of the Ohio and Potomac rivers and east of the Mississippi. By the end of 1907 the Standard Oil group was carrying on can businesses in about twenty-five cities, among them Camden, Trenton, Baltimore, Washington, and Norfolk in Jersey Standard's own territory.[31]

Various considerations contributed to the decision to expand peddling to householders in cans. Among the factors were the increasing concentration of population in cities, the gradual reduction in prices by producers of artificial gas, the rapid switch to electric lights by millions of people, the adoption of more efficient distributive programs by competing oil companies, the availability of plentiful supplies of kerosene from Standard Oil's expanding refineries, the continued heavy markups by retailers in spite of advice to the contrary, and the promises of profit.

Although Standard Oil marketers, aided by New York Standard's experienced W. R. King, tackled peddling operations as systematically as they did every other phase of petroleum operations, they soon learned that the new type of activity was a frustratingly complicated business. Managers had a patented can, spout, and automatic filling machine by 1900, but they felt impelled to incorporate four improvements in the filling machine during the next eight years; the new ideas came from the American Petroleum Company. Most cities insisted on licensing peddlers, and New York City prohibited can-peddling of oil on Manhattan Island. Many new peddling units, as well as those purchased by Standard Oil, did not advertise their association with the combination, an action which provided new evidence of unfair hidden companies. Most sales were made to low-income families, a situation which dictated the abandonment of the five-gallon can and the almost exclusive utilization of one containing one gallon only. The refill was easy to pay for, and the can was easy for the housewife to hold when filling a lamp. Gasoline, being highly inflammable, was put in distinctive red cans. Routes of peddlers had to be planned with great care. A can wagon could not be run profitably on an output of less than 120 gallons per day, and King and his associates soon found that many peddlers did not attain that gallonage. In fact, Standard Oil men plunged into can-peddling too quickly and too extensively, with

the result that they had to withdraw from several cities before 1910 and were left with a surplus of equipment.

Regularity of supply by the friendly tank-wagon driver was probably one of the most important reasons for the continuing success of Standard Oil in marketing its products. In all kinds of weather and at all seasons of the year, whether by tank wagon or tank sled, drivers regularly kept supplied the tanks of retailers at rural crossroads, in large cities, and little hamlets. Buyers could not but be impressed with Standard Oil service—a recognized nation-wide achievement. Moreover, even when sentiment rose against the company after 1903, many purchasers felt loyalty to and sympathy for the little man who was just an employee of the combination and had little to do with its organization or its general policies. While some retailers turned to competitors, thousands upon thousands of customers continued to buy Standard Oil products, including various departments of the federal government, though not the Attorney General's office so far as available records indicate.

While extending techniques acceptable to both the petroleum industry and the public, Standard Oil managers modified some long-criticized methods of maximizing sales and retained others. Desiring profits for the long run and having become the symbol of Big Business as well as the prime target of attack against it, Jersey Standard had more reason than most other large companies to adjust practices to popular concepts wherever possible. On some points at issue Archbold and his associates acted with a degree of foresight about new rules, on others they continued to follow the mores learned in the 1860's and 1870's—the days of their youth and early training as small, relatively powerless businessmen.

Allegations regarding unfair behavior by Standard Oil marketers centered on four main assertions. These were (1) that men in the combination practiced espionage to gather information on competitors' shipments and then used the collected data to coerce the competitors, (2) that they operated hidden (also known as bogus, dummy, and secret) companies, (3) that they bought out competitors in order to maintain dominance of the market, and (4) that they indulged in such price discriminations as rebates to favored retailers and cutting prices in one locality while charging exorbitant prices in other areas.[32]

As to the Standard Oil collection and use of information on competitors' sales of petroleum products, a weighing of the conflicting evidence in various suits and investigations points to several conclusions. Prior to 1897 a small number of Standard Oil marketers did buy information from rail-

road employees and a few did copy data about competitive shipments on railroad stationery. Some charges of Standard Oil men spying on competing tank-wagon drivers were never denied and thus must be taken as true. Most of the accusations that Standard Oil men acquired information on competitors direct from railroad employees, either through friendship or bribery, were based on hearsay, or on circumstantial evidence and inference, and were never proved in court, though the mere volume of testimony and documentary substantiation pointed to guilt. Standard Oil's enunciated policy was to collect facts on shipments and sales of competitors by honorable and legitimate means—that is, by observation and conversation on the part of salesmen when calling at freight offices and on retailers along the tank-wagon routes. Consistent violators of that rule were discharged. For all the years through 1911, evidence of Standard Oil misbehavior with reference to collection and use of information involved only a small percentage of all the marketers and bulk stations of the combination in the United States and was much slighter in volume for the period after 1899 than for earlier years. On the other hand, advance data on a competitive shipment led to an offer of a gift of three hundred barrels of oil to a retailer in Gallatin, Tennessee, and resulted in the conviction of Kentucky Standard in 1910 as a violator of the state's antitrust law and the ousting of the company from the area.[33] The public statement of Standard Oil's general policy undoubtedly was accurate, but under pressure to maintain sales obviously not all employees observed the rule.

In order to reduce the flow of competitive oil to market, Standard Oil officials admittedly purchased oil from and bought out rivals. In the years after 1898 Archbold and his associates testified on many occasions that they had purchased both distillates and refined products from outsiders and had acquired not only the refineries of The Manhattan Oil Company (a fact divulged reluctantly) and Scofield, Shurmer & Teagle but also a few small jobbing firms and numerous peddling businesses.

Those purchased concerns constituted a segment of the hidden companies utilized by Standard Oil marketers since the 1870's. In most cases they operated purchased businesses under former or similar names for a short period of years in order to wring the last ounce of advantage out of the good-will acquired. Other hidden companies, such as those managed by Louis Blaustein in the Baltimore Division of Jersey Standard, were directed toward "jacking up" a Standard Oil salesman, or regaining trade lost by an inefficient tank-wagon driver, or acquiring more trade in an area previously effectively dominated by retailers of competitive oil. In

many instances the hidden companies accomplished their objective; in others they failed. The outstanding example of a hidden marketing unit was the Republic Oil Company, a New York corporation vested with the marketing business of Scofield, Shurmer & Teagle. Republic's first vice-president and general manager was Walter C. Teagle, son of John Teagle of the predecessor firm, and later director and president of Jersey Standard. Operating aggressively, particularly in certain portions of the territories of Waters-Pierce and Indiana Standard, Republic concentrated on selling to retailers who were opposed to Standard Oil and to those preferring the high-grade "Palacine" brand made famous by Scofield, Shurmer & Teagle. The properties of Republic were sold to other Standard Oil marketers during the years from 1903 to 1907, voluntarily in the first two years and under the pressure of litigation later.[34]

In 1906 Standard Oil managers decided at long last to abandon the practice of using hidden companies. "It has been deemed impolitic to continue connections of this character," wrote William Donald to DAPG on May 18, "and we are, therefore, terminating them and doing the business under our own name whether . . . distribution be by barrels, tank wagons, or tin cans to consumers."[35] This statement came just about two weeks after the first report of the Bureau of Corporations on the petroleum industry had appeared. Although still convinced of the legality of holding hidden companies, Archbold and his associates finally bowed to pressure from competitors, the press, and public agencies, as well as long-standing convictions of some members of the combination, and accepted a new rule for the behavior of large-scale business enterprises in the United States. The example was not followed by all foreign affiliates of Standard Oil, however.

With reference to domestic price policy Standard Oil executives showed no deference to public criticism until changes in the law forced them to do so. Wherever possible they consistently followed the policy enunciated in 1902 by Livingston Roe in a letter to agents of the Standard Oil combination in the Far East: "It is our practice at home to regulate our selling prices in the various territories in the U. S. with regard to the competition we are meeting in each particular place, and to make up in one place for the sacrifices we are obliged to make in others."[36] It was the policy which had been followed by the small businessmen who entered the Standard Oil alliance in the 1870's and had remained unchanged by them or their successors after the combination became the giant of the petroleum industry. Both statements of critical competitors and statistical evidence in

the dissolution suit indicated that Standard Oil marketers continued the policy right up to the initiation of the case and later.

The fact that Standard Oil men engaged in local price cutting does not mean that they always started price wars. Normally the firm that wanted to enlarge its share of a given market cut prices first. Standard Oil marketers seized the initiative in San Diego when they wanted to make certain that competitors would not enter the area. In order to start their trade, peddlers of the combination also sold below prevailing prices in the neighborhoods which they entered; after they had acquired a share of the markets, they endeavored to keep their prices at the level of their competitors. Outside marketers followed the same practice when they desired to grasp an increasing share of the market in any particular city or town. W. W. Tarbell of the Pure Oil group admitted that, although employees of his company had orders not to cut prices, he could readily believe that they might do so.[37]

Neither side, though willing to boast that the consumer benefited by the lower prices instituted by its company, was ever willing to admit the initiation of price cutting. Indeed, it was difficult for anyone, even prosecutors, to elicit definite information establishing primacy in the reduction of prices. Paying rebates to retailers, a competitive measure opposed in principle by Standard Oil marketers but occasionally practiced by them, often set off price wars. When Standard Oil men were told by bargaining customers that they were receiving rebates from competitors, salesmen of the combination usually preferred to lower posted prices to an equivalent level. The drawback in that procedure lay in the ability of the competitor to proclaim that "the Octopus" had cut prices first.

The contention of Ida Tarbell and others that Standard Oil "cut to kill" was definitely exaggerated. On several occasions, seasonal or special price reductions by Standard Oil for an area or a region were interpreted by small local operators as a cut directed at them. Numerous witnesses under cross-examination in the dissolution suit admitted that they had increased their volume of sales and had operated profitably in spite of price competition with the combination. Some did suffer severely without a doubt, some sold out, and some failed, but many others stayed in business.

In general, Standard Oil policy in price wars was to be the last down and the first up, and for simple reasons. Managers of every company in the combination desired liberal profit margins, not only by habit over the years but by the necessity of making a good showing in competition with other Standard Oil companies. Reductions in price had to be approved by

a committee at 26 Broadway in most instances, and that slow managerial technique time after time left the initiative in the hands of the competitor. Moreover, price cuts by Standard Oil reduced profit margins on seventy to eighty-five gallons of refined products for every thirty or fifteen of the smaller operators' gallons. Even though Standard Oil marketers had powerful financial backing, they were reluctant to show declines either in volume of sales or in profits.

As a matter of fact, after 1904, various states began reducing the opportunities for Standard Oil and similar large organizations to engage in local price cutting. Beginning with Kansas and Iowa in 1904 and 1906, several state legislatures passed so-called "anti-discrimination" laws which permitted variation of prices within each state only to the amount of the differences in handling charges and in transportation costs from a given central point. Reduction in prices was unlawful if done to destroy competition. Actively encouraged by the National Petroleum Association, the states of Illinois, Wisconsin, Missouri, North Dakota, South Dakota, and Minnesota had followed the example of Kansas and Iowa by late 1907, and soon other legislatures in the Lower Mississippi Valley adopted the uniform price technique.[38] Standard Oil marketing units and other large firms then sought, not always successfully, to follow the letter of the laws which had been enacted by politicians desiring to protect the small businessman.

Every one of the techniques used by Standard Oil marketers was adopted by competitors, either before or after organization and systematization of the methods by the combination. Every company that was financially able utilized the instruments of mass distribution—tank cars, bulk stations, tank wagons, wooden and steel barrels and drums, cans, brands, trade-marks, and advertising. Many peddled in cans. Some bought up competitors, formed combinations and integrated companies, obtained advantageous rates from railroads, owned hidden companies,[39] gave rebates to retailers, occasionally initiated price wars, and engaged in local price cutting.

In addition, numerous measures adopted by competitors went quite beyond Standard Oil techniques. Attacking Standard Oil practices and products, either directly or by inference, had been an accepted procedure of competitors since the emergence of the great oil alliance in the 1870's. Rivals continued to use the weapon into the twentieth century, though attacks on the quality of Standard Oil products were practically never heard after 1900. Such names as The Pure Oil Company, Limited, The

Independent Oil Company, and the Anti-Trust Oil Company in themselves advertised opposition to the giant combination. Competitors vigorously promoted the enactment of state uniform price laws. In testimony before the Industrial Commission at the end of the nineties, Lewis Emery, Jr., and other competitors of Standard Oil advocated ownership of the railways by the federal government.

Probably no testimony portrayed the general competitive picture more effectively than that of E. N. Wootten, a man with experience both in and out of Standard Oil. After giving much detailed information about the practices of Kentucky Standard and competitors, he said that his experience since leaving the company in 1904 had demonstrated to him "that the evil example" set by the Standard Oil Company "had very largely permeated the commercial world." He phrased his views in extreme terms, believing as he did that the Jersey Standard combination dominated the "great industrial enterprises of the country generally." Nevertheless, because "one has to make a living" even if "one may not entirely approve of the practices that obtain in this generation," Wootten asked to be reemployed by Kentucky Standard in January, 1908. "Since leaving the employ of the company," his letter of request ran, "my opinion of them [its managers] has materially altered and I do not now regard their policies as very different in principle to those generally in vogue commercially throughout the country in small and large concerns."[40]

MISTAKES AND THE RECORD ON SALES

As the foregoing analysis of techniques indicates, Standard Oil marketers had not fully realized by the early 1900's that a large business unit had to live by more stringent rules than a small one. That they still made numerous mistakes is clearly evident. A policy of mere conformity to the letter of laws regulating interstate commerce, though natural and understandable, showed that Archbold and his associates learned all too slowly that the powerful elephant must necessarily step more carefully than an independent little gnat. Since there were no industry-wide data on sales of petroleum products, Standard Oil men had to collect statistics if the business was to be run systematically, but the methods of acquiring information should have been above suspicion. At the same time, avoidance of criticism in gathering data on competitors' shipments was a virtual impossibility. If top managers testified honestly as to their policies, and presumably they did, then the control over some local salesmen was woefully weak. Any man using threats or coercion to induce a buyer

to cancel an order given to a competing seller should have been discharged at once, and instructions to all salesmen should have been explicit on the point.

Standard Oil executives obviously delayed too long in abandoning the use of hidden companies. Even if competitors also indulged in the practice, the "bogus" firm had been a weak spot in Standard Oil armor for a generation. To expose the entire organization to attack just in order to maximize short-run profits in a few towns constituted one of the most shortsighted practices of top management.

Marketers of the combination also plunged into can-peddling too quickly and too extensively. Success in the peddling business depended on maintaining a large volume of daily sales and on payment in cash. Many storekeepers in small urban centers retained their trade by allowing credit. After losing money for a period of years, Standard Oil marketers had to withdraw from peddling in a number of cities.[41]

Considerations of their pre-eminent position, vulnerability to attack, and excellent margin of profits might well have induced Standard Oil executives to modify their policy of maintaining wide price differentials within individual states and regions. The continuation of that practice of making up on the swings what they lost on the roundabout caused much criticism and ultimately led to the restrictions of uniform price legislation in various states, not to mention an important avenue of attack in antitrust litigation. Since earnings were good on all other functions performed by the organization, price-makers could easily afford to reduce prices to consumers by reductions over wide areas and to establish uniform prices, exclusive of freight and handling charges, over whole states and regions, if not the nation.

On the other hand, Standard Oil men were actually on the horns of a dilemma. If they competed by lowering prices at one point while maintaining high prices elsewhere, they were condemned. If they reduced all their prices in a division or area, they were criticized as destroyers of small competitors. Had they established uniform prices for the nation in order to compete vigorously with every small opponent, the outcry against "the Trust" would undoubtedly have been stentorian. By virtue of their position, Standard Oil men were sure to be damned if they did compete vigorously and as surely damned if they did not. That situation constituted the greatest weakness of a nation-wide organization.

In spite of many mistakes, Standard Oil domestic marketers made an impressive record over the years from 1899-1911. Although kerosene sales

in the United States reached their peak in volume for the period with 11,568,214 barrels in 1903, the decline thereafter was relatively slow. (See Table 41.) By 1911 the volume had dropped to 10,621,695 barrels, a not unsatisfactory showing in the face of rising competition from gas, electricity, and other companies in the petroleum industry. The marketers probably had can-peddling to thank for a good part of their success in holding the line. Nevertheless, the decline of 8 per cent in the demand for

Table 41 ANNUAL SALES OF KEROSENE AND NAPHTHA AND GASOLINE IN THE UNITED STATES BY STANDARD OIL COMPANY (NEW JERSEY) AND ITS AFFILIATES,[a] 1900-1911

In barrels of 42 gallons

Year	*Kerosene*	*Naphtha and Gasoline*[b]
1900	10,365,427	3,455,060
1901	10,688,125	3,890,743
1902	11,472,732	4,350,583
1903	11,568,214	4,558,954
1904	11,122,873	4,696,026
1905	11,038,452	5,384,640
1906	11,161,176	5,929,436
1907	11,099,156	6,023,975
1908	10,177,030	6,514,501
1909	10,092,970	7,769,462
1910	10,344,085	9,209,849
1911	10,621,695	10,941,052

[a] This table does not include data on operations of the Waters-Pierce Oil Co.
[b] This does not include gas naphtha sold to gas companies or others.
Source: Socony Recs.

the major product within seven years could well have been serious had not sales of naphtha and gasoline grown appreciably year after year. Basking in the sunny smiles of Providence, Standard Oil men helped to push gasoline sales until their volume surpassed that of kerosene in 1911 for the first time. Particularly significant was the increase in the combined sales of kerosene and naphtha and gasoline during the years 1900-1911—from 13,820,487 barrels to 21,562,747, a rise of 56 per cent.

Nevertheless, as Table 42 indicates, Standard Oil marketers failed to keep pace with the expansion of the market for petroleum products. Their relative position in both kerosene and gasoline sales declined between 1906 and 1910, two years for which comparable figures are available for Canada and the United States outside the territory of the Waters-Pierce Oil Company. Their share of the kerosene market slipped from 82.1 per

Table 42 ANNUAL SALES OF KEROSENE AND NAPHTHA AND GASOLINE IN THE UNITED STATES[a] AND CANADA BY STANDARD OIL COMPANY (NEW JERSEY) AND ITS AFFILIATES, 1906 AND 1910, CLASSIFIED BY MARKETING DIVISIONS

In barrels of 42 gallons

Eastern Market	Kerosene				Naphtha and Gasoline			
Companies and Their Divisions	Quantity		Per Cent of Market		Quantity		Per Cent of Market	
	1906	1910	1906	1910	1906	1910	1906	1910
Atlantic Refining Co., The								
Pittsburgh[b]	309,990	244,880	84.4	83.6	108,902	120,312	84.6	86.9
Philadelphia	639,562	601,949	89.0	86.5	271,776	410,634	86.2	78.9
Standard Oil Co. (New Jersey)								
Baltimore	902,230	869,361	89.9	81.5	222,375	349,843	88.3	74.2
Newark	418,511	383,628	90.4	86.4	240,817	371,821	84.0	79.6
Standard Oil Co. of New York								
New York Stations	799,007	711,670	94.1	88.8	221,623	423,008	95.3	88.0
New York City	520,764	594,938	91.1	89.8	304,840	703,395	87.3	83.6
New England	1,362,114	1,027,534	93.2	85.4	562,546	831,329	93.1	88.5
Imperial Oil Co., Ltd., The								
Toronto	213,899	227,029	82.4	85.0	52,217	107,111	81.9	95.3
Montreal	130,856	166,793	79.1	83.4	27,117	60,846	83.2	84.2
St. John	43,193	49,682	85.0	90.1	3,383	14,838	87.6	87.5
Halifax	55,887	59,568	93.9	96.1	4,192	15,885	97.2	92.3
General Trade[c]	336	61	...	...	2,232	7,173	...	...
Total Eastern	5,396,349	4,937,093	90.4	86.0	2,022,020	3,416,195	88.9	83.6

Table 42 (Continued)

Western Market Companies and Their Divisions	Kerosene Quantity 1906	Kerosene Quantity 1910	Kerosene Per Cent of Market 1906	Kerosene Per Cent of Market 1910	Naphtha and Gasoline Quantity 1906	Naphtha and Gasoline Quantity 1910	Naphtha and Gasoline Per Cent of Market 1906	Naphtha and Gasoline Per Cent of Market 1910
Continental Oil Co.	194,795	229,587	98.9	89.9	77,256	224,234	98.3	83.7
Standard Oil Co. (California)	492,487	538,189	93.5	82.7	412,365	833,723	84.6	67.5
Standard Oil Co. (Indiana)	3,016,561	3,082,644	87.6	78.7	2,233,673	3,357,049	90.6	82.8
Standard Oil Co. (Kentucky)	959,243	715,211	87.8	83.6	243,788	296,725	94.1	65.7
Standard Oil Co. of Louisiana	[d]	274,343	...	85.5	[d]	90,655	...	81.7
Standard Oil Co. (Nebraska)	142,920	162,912	78.5	71.2	113,356	198,839	95.1	77.3
Standard Oil Co. (Ohio), The	638,658	599,198	86.1	83.0	598,733	745,153	90.4	81.2
Imperial Oil Co., Ltd., The								
Winnipeg	94,957	118,540	79.0	64.0	25,248	119,117	66.8	62.2
Vancouver	...	33,258	...	...	...	42,667	...	...
General Trade[c]	576,117	307,980	75.3	43.0	291,260	245,955	88.7	52.9
Total Western	6,115,738	6,061,862	86.5	76.9	3,995,679	6,154,117	90.0	77.0
Grand Total	11,512,087	10,998,955	82.1	75.3	6,017,699	9,570,312	84.4	74.3

[a] No report was made by Waters-Pierce Oil Co.
[b] The title of marketing divisions, often city of headquarters, used in the original statistical reports, is retained.
[c] This is presumed to be sales direct to large consumers.
[d] Sales in this district were under Standard Oil (Kentucky) until 1909.
Source: Socony Recs.

cent to 75.3 and for naphtha and gasoline from 84.4 to 74.3. Three-quarters of a market appears a tremendous proportion at this late date, but Standard Oil salesmen at the time must have felt frustrated by their inability to stem the rising tide of competition from inside and outside the petroleum industry.

As is usually true in dealing with over-all figures, the statistics for the entire area obscure many variations in detail. Marked divergence appeared between the Eastern and Western markets for kerosene and for naphtha and gasoline as well; in the Eastern area Standard Oil marketers lost only 4.4 percentage points on kerosene, while the Westerners were losing 9.6; comparable figures for naphtha and gasoline were 5.3 and 13. On the latter products, only the Pittsburgh unit of Atlantic Refining and Imperial Oil improved their relative positions in the Eastern market, while none of the Western divisions showed anything but declines; Kentucky Standard, in combination with Louisiana Standard, lost position most remarkably—25.3 percentage points in four years—but Nebraska Standard and California Standard followed closely with declines of proportions amounting to 17.8 and 17.1 respectively. With reference to kerosene sales, in every Eastern division except New York City and Canada the volume of sales declined, while in every Western division, except Ohio Standard, they increased absolutely though not relatively. The general picture reflected the growing competition from gas and electricity in lighting homes in Eastern cities, while the success in selling in New York City probably was closely related to the vigorous can-peddling campaign during those years.

Jersey Standard and affiliates occupied a lower position in fuel oil than in kerosene and gasoline. Sales of oil as industrial fuel rose spectacularly in Texas and California, where Standard Oil's competitors possessed the advantage of an early start. In the Upper Mississippi Valley and Eastern areas, however, Standard Oil was in the premier position. In 1906 Standard Oil interests delivered to home trade 11,682,521 barrels of 42 gallons of petroleum or its derivatives for fuel purposes.[42] No statistics have been found on fuel oil sales by the combination after 1906. Its share in the estimated 62,000,000 barrels of crude and "topped" petroleum consumed as fuel in 1911 was respectable without a doubt, although on the Pacific Coast, where 50,000,000 barrels of the total were consumed, competitors probably left California Standard behind, since that company specialized in refining the lighter fractions.

While the quantity of products distributed by Standard Oil marketers

was rising as indicated, the margin of profit on sales was declining. Earnings from marketing all Standard Oil products rose from $10,229,054 in 1900 to $13,950,893 in 1910, then dropped to $12,774,213 in 1911. In other words, earnings on marketing increased 24 per cent between 1900 and 1911, while the volume of kerosene and naphtha and gasoline sold rose 56 per cent. A similar development in sales of lubricants and wax, the subject of the next chapter, merely emphasizes the point that marketing profit margins on Standard Oil sales grew narrower after the 1890's, particularly after 1903.[43]

Though still running far ahead of other petroleum companies in the domestic market, during the thirteen years preceding 1911 Standard Oil had had its lead cut materially. In a market characterized by a dwindling demand for kerosene and a rapidly expanding one for gasoline and industrial fuel oil, the changes were too quickly effected for the combination to keep pace with the growth of the industry. Standard Oil managers used every technique at their command. They extended tank-wagon distribution and adapted it to gasoline sales. They expanded the number of bulk stations and varied package deliveries according to economic circumstances. They increased the use of brands, trade-marks, and advertising and plunged into can-peddling to sustain sales of kerosene. Under pricks and prods from members of the directorate and staff, and from state and federal legislation and litigation, Archbold and his associates sought, usually but not always successfully, to apply fair practices in assuring the lowest possible transportation costs and in collecting and using information on competitors' shipments. The same pressures led the directors to abandon the utilization of hidden companies and to a modification of local price cutting. Since deviations from the rules of behavior were numerous enough to arouse criticism, however, the managers evidently failed to educate their sales forces thoroughly and to enforce the enunciated policies rigidly. Simultaneously, the maintenance of a relatively high price level and the emergence of new fields in many parts of the country led to rising competition. The net result of all efforts was an increase in the total volume of sales, accompanied by a decline in Standard Oil's proportion of the national market and a narrowing of profit margins. Thus, even before the breakup of the combination, the process of whittling Standard Oil down to reasonable size within the industry was already far advanced.

Chapter 16

Lubricants and Wax, 1892–1911

FROM 1892 onward the Standard Oil Company (New Jersey) had a major concern with developments in lubricating oils, waxes, and such specialties as vaseline and grease. The corporation owned two plants concentrating on the manufacture of lubricants, the Eagle and Parkersburg works, while the two at Baltimore and Bayonne produced increasing amounts of pressed-paraffin oils as a concomitant of expanded production of kerosene and naphtha. In addition, the Jersey Company held all Standard Oil's interest in the companies specializing in the manufacture and marketing of lubricants. Though the Jersey Standard Board as such was not the controlling factor in the activities of those specialists, it was vitally concerned with the flow of dividends from them.

Policies pursued in the manufacture and marketing of lubricants, waxes, and specialties manifested no noticeable change from those of the 1880's. As mirrored in actions, those policies were to leave management almost exclusively to operating heads. They in turn labored steadily to expand volume of manufactures, sales, and profits by providing products for every conceivable use at the time and by improving and assuring quality.

Co-ordination of the manufacture and sale of lubricants and waxes rested with the increasingly informal Lubricating Oil Committee. Its membership changed completely after 1902. E. T. Bedford ceased his participation when he became a director of Jersey Standard in 1903. F. H. Bedford succeeded his brother on the committee and assumed the chairmanship six years later. S. H. Paine retired from service at the end of 1907, and O. T. Waring devoted an increasing amount of his time to managing the building at 26 Broadway. E. T. Bedford's son, Charles E., who had begun his working career with Swan & Finch in 1891, was participating in the deliberations of the committee by 1905 and was elected to the directorate of the Vacuum Oil Company two years later. George P. Whaley, another representative of Vacuum Oil, had appeared on the committee at least a year earlier, while W. A. Barstow, son of F. Q. Bar-

stow, apparently took Paine's chair at the conference table in 1908. Sessions with spokesmen for Vacuum Oil occurred weekly.[1]

The outstanding characteristics of the market for lubricants were rapid expansion in volume, increasing diversification in use, and insistent demand for improved quality. The years after 1890 witnessed the complete victory of petroleum lubricants, either as pure mineral or mineral-based, over animal and vegetable lubricating products. The manufacture and sale of petroleum lubricants kept pace with the speedy adaptation of the machine to production, distribution, and transport of goods in the world, especially in areas bordering on the North Atlantic. To the list of such users as wagons, buggies, locomotives, and spindles were added steel mills and Diesel engines, gasoline motors, and automobile chassis. Both old and new types of machines were built with narrower tolerances for operation at higher speeds, often under greater pressures and at much higher temperatures than ever before. Year-round motoring and increasing adoption of artificial refrigeration also demanded lubricants that would be effective at low temperatures. These conditions called for products capable of lubricating a wide range of moving parts under a variety of specific conditions.

Paraffin wax also had become a product of many uses by the end of the century. Its utilization in preserving foods spread widely, and demand for almost innumerable varieties of paraffin candles increased enormously, both at home and abroad, because of the extreme cheapness of the mass-produced commodity. Contemporary commentators recorded the adaptation of paraffin wax to many other uses—lining wooden and metal containers of acids, coating splints and other appliances subject to septic influence, covering cartridges, fresh fruit, and matches, securing high polish on clothing in laundries, waterproofing paper and fabrics, and as a vehicle for fulminate. The new electrical industry provided an especially important market; as a nonconductor paraffin was used for insulation, from manufacture to installation of electric equipment. "You can not make a joint of a pipe without the use of paraffin wax; you can not string a telephone or scarcely a telephone line without the use of paraffin wax," said Lewis Emery, Jr., as early as 1899. "It enters into everything pertaining to electricity."[2]

As Emery's testimony indicates, competitors were no less aware of the opportunities in producing lubricants and waxes than Standard Oil executives. Manufacturers of lubricants exclusively from Pennsylvania-grade petroleum could and did argue with accuracy that their product was su-

perior in quality to that from Lima-Indiana and most other crudes during these years. To enter the manufacture of lubricants required relatively small amounts of capital and to establish a marketing business in the field necessitated even less capital outlay. Competition grew vigorously. For the Western European market in lubricants, sellers of American products competed with British and Continental companies distributing oils from Galicia and Russia. The American runner-up to Standard Oil manufacturers of candles was Will & Baumer, which is still in existence. The Scotch shale companies and associated candlemakers provided strong competition for marketers of American wax and candles in the United Kingdom and Western Europe.

IMPROVEMENT OF PRODUCT

In improving the quality and expanding the range of lubricating and wax products, Standard Oil managers followed two courses of action. The primary method was, through experimentation and empirical research, to manufacture lubricants and wax for every market demand; this procedure involved the adaptation of existing goods to new needs and the creation of new products. The second and least used practice was to purchase competing firms in whole or in part.

The acquisition of Borne, Scrymser & Company by Jersey Standard added a prosperous international lubricating oil and wax business to the Standard Oil family. Beginning in the 1870's, John E. Borne and C. Howard Scrymser had built up a trade in lubricating oil and wax, which extended from British Columbia to Austria-Hungary. Pressed by Scrymser's failing health and unfavorable conditions of business, by 1893 the partners were willing to sell out when offered a remunerative price by W. H. Tilford. Executives of Standard Oil were attracted to Borne, Scrymser & Company by four considerations—the business of the firm in the United States and Europe, its ownership of shares in the United States Pipe Line and in the Argand Refining Company of Marietta, Ohio, and the removal of a competitor. On the day the final contract for purchase was signed, the business was transferred to a new corporation bearing the name of Borne, Scrymser Company. The refining operations of the former partnership at Elizabethport, New Jersey, ceased within a year, but the company continued to compound and sell lubricating oils under its own trade-mark and brands and is still in business.[3]

At just about the bottom of the depression for the sale of petroleum products in the 1890's, Standard Oil moved to acquire a greater share in

the lubrication of the rapidly growing steel, tin plate, and rolling mills. Once again Standard executives followed the policy of allying themselves with the outstanding figure in a business. In 1885, shortly after graduation from college, Grant McCargo, son of a well-to-do businessman in Pittsburgh, formed a partnership with one Walter Dimock to manufacture a "hot neck" grease for use in iron and steel, rolling, and tin plate mills. Originally devised to compete with Batson's, an English grease, the "hot neck" product of McCargo & Dimock became the cornerstone of its business. In 1890 Dimock sold out his interest in the partnership, and McCargo formed another under the name of the Pennsylvania Lubricating Company. Five years later, under an agreement with Standard Oil Company of New York, a $50,000 corporation using the second partnership's name was organized, McCargo holding 40 per cent and Standard Oil interests the remainder. The contract provided that the Pennsylvania Lubricating Company, Incorporated, should have the exclusive right within the Standard Oil group to manufacture and sell greases to rolling mills, tin plate mills, steel mills, nail mills, and sheet mills in the United States, while all petroleum products needed in the manufacture were to be purchased from Standard Oil companies. Enjoying the advantages of the best possible location and good formulae, within three years the company paid 140 per cent in dividends. Thus began the present Pittsburgh Grease Works of the Esso Standard Oil Company.[4]

Both new and old Standard Oil manufacturers of lubricants and wax from 1892 to 1911 relied on techniques established in earlier years. For primary distillation almost all plants utilized the batch system. At Bayonne the naphtha and kerosene fractions were removed in Van Dyke tower stills, at the Eagle Works in steam stills, and at the Rochester plant of Vacuum Oil in stills using a partial vacuum. Some plants produced some lubricating oil distillate by the continuous process, but most units following that procedure turned out fuel oil rather than distillate for lubricants.

Every lubricating oil and paraffin wax plant grew in equipment year by year. Bayonne's appropriation records reflect a steady accretion of equipment, with surges in the years from 1892 to 1894 and from 1908 to 1911. Nonexistent in 1882, the plant of the Eagle Works thirty years later included sixty-one batch fire stills, sixteen steam stills, twenty-two wax presses, seven wax sweaters, fifteen agitators, eleven deblooming bleachers, and one filter house. Three dynamos supplied electricity for lighting, and seventy-two boilers of various ratings from one hundred to four hundred horsepower provided steam for the entire operation. Vacuum

purchased and adapted to its own use the Olean plant of New York Standard in 1902 and built several plants abroad during the period under review.[5]

At the same time, lubricant manufacturers utilized their equipment in a way to increase the range and quality of products. Reruns became too numerous to permit simple description. The important factors were the use of more effective controls and the growth in the workers' experience with equipment and processes—that indefinable "know-how" which enables one group of workmen to produce with a given set of equipment a product superior in quality to that turned out by another group with the same machine. A much wider range of basic oils was produced in this fashion. In addition, further primary products were produced by blending. These were then used for compounding other lubricants and greases. The primary products at Bayonne rose from six in the late 1880's to ten (910, 885, and 865 oils as well as Regular 910, Solar Red, 700, HV, Bayonne Engine, Ice, and Polarine oils) in 1911. In addition, blended oils sent from the plant numbered five—Special 910, 470, and No. 1 Red, No. 2 Red, and No. 3 Red.[6]

Though basic technological changes were not made during these years, Standard Oil men made two major improvements in treating lubricants. In 1893 G. H. Taber of Atlantic Refining patented the fuller's earth or clay process as a substitute for the "rather brutal" sulphuric-acid method previously used throughout the industry. Several, though not all, Standard Oil lubricating oil plants adopted the Taber process during the 1890's and later. Bayonne managers found it satisfactory, while the men at the Eagle Works continued to use the sulphuric-acid technique. The clay came from England at first but later was supplied from Florida land owned by Jersey Standard. The second advance in treating methods came just at the end of the period under review. Oliver Shiner at Bayonne devised a technique for continuous agitation and treating which was not fully applied even at that refinery before 1912.[7]

In manufacturing paraffin wax after the 1880's there were fewer technological innovations than in making lubricants. The ring hydraulic filter-press method, introduced in the 1880's and in use until the 1950's, was extended from Bayonne and other early adopters to all Standard Oil waxmakers in the ensuing years. The "sweating" process and equipment patented by Dr. Norman Henderson of the Broxburn Oil Company, Limited, spread from Scotland to East Coast plants and to those in the West, except for Whiting. Brine-circulating refrigerating machines (Gray, Vogt,

and Carbondale) replaced ammonia-expansion mechanisms for manufacturing wax and low-cold-test lubricants. Pressure for improvement in quality of wax came from insistence of marketers that their supplies must satisfy more and more rigid standards, a demand met by manufacturers through more careful operation of crude stills, tar stills, and reducing stills and by greater exactness in pressing, melting, and re-pressing.

New equipment enabled more plants to manufacture refined wax of a better quality. For example, the Baltimore Refinery began processing its wax distillate in 1906, and Bayonne built a new plant and began for the first time about 1909 to make a range of refined wax of 118°, 122°, 125°, and 130° melting points.[8]

Lubricants produced by the combination, which attempted to more than match the offerings of all its competitors, seemed to have reached a point of minute differentiation in comparison with those of the 1880's. By 1911 the Eagle Works was listing 80 or more different products. An inventory at Parkersburg showed 21 filtered lubricants and 23 compounded. Indiana Standard boasted 162 types of black, filtered, neutral, and compounded lubricating oils at the same time. Several types of special motor lubricants had already appeared, the best known being Vacuum's Mobiloil and Standard Oil's Polarine. Galena-Signal continued to provide the basic oils for railroad lubrication and signaling, although it had to change its formulae because of the dwindling supply of Franklin crude oil. At its plant in Elizabeth, New Jersey, the Borne, Scrymser Company compounded its own products for sale at home and in Europe. In South Brooklyn the Swan & Finch Company manufactured a range of oils and greases for sale under its brand name of Atlas. Among its other products were harness oils, belt dressing, neat's-foot oil, hoof oil, and thread-cutting oils. Over a thousand trade names helped in selling the whole range of lubricating oils and greases to the consuming public.

At least seventy-five different types of grease were being manufactured by the various companies. The Pennsylvania Lubricating Company, Incorporated, alone had increased its list from one in the mid-eighties to fifty-four by 1906; all formulae were unregistered and kept in a book carefully guarded by Grant McCargo himself.

Specialty products numbered in the hundreds. Standard Oil manufacturers made twenty different types of paraffin wax, candles in three hundred different grades and sizes, six grades of petrolatum, and vaseline.[9]

EXPANDING THE MARKET AT HOME AND ABROAD

The chief stimuli for the increasing number of products and their steady improvement in quality came from the marketers. Salesmen and lubricant experts sought to satisfy the demands of every customer and insisted that the manufacturing departments meet the specifications stipulated. Railroad locomotives, textile machinery, and gasoline motors really constituted active experimental laboratories as far as Standard Oil lubricant manufacturers were concerned. The Manhattan laboratory, developed by F. W. Arvine and James E. Denton in the 1880's, then sought by continuous tests to establish the standards which the manufacturers must attain. Marketers were key factors in the success of Standard Oil lubricating oil units, not only as sellers of goods but as transmitters of consumers' demands. The ultimate user was the boss, and salesmen of Standard Oil's lubricants succeeded in selling a larger percentage of their products directly to their consumers than did marketers of kerosene and gasoline.

The Lubricating Oil Committee co-ordinated the operations of marketers of lubricants and specialties but left decision making and routine management almost exclusively to the managers of the different units. That arrangement held for John E. Borne, president of Borne, Scrymser Company to 1910, and for Alden S. Swan, Charles N. Finch, and James C. Peabody, the men who were the chief executives of the Swan & Finch Company from 1891 through 1911. Charles Miller, aided by S. A. Megeath, ran the business in Galena and Signal railroad oils. Charles Miller personally negotiated most of the original contracts with large railroad companies. C. M. Everest, who succeeded his father as president of Vacuum Oil in 1906, was the outstanding figure in that company, though he was ably assisted by Edward Prizer, G. P. Whaley, and C. E. Bedford. The Chesebrough Manufacturing Company, Consolidated, maker of vaseline, operated almost independently under the general management of Oswald N. Cammann, who became president in 1909.[10]

Grant McCargo apparently ran the Pennsylvania Lubricating Company with less reference to 26 Broadway than any other manager of a company more than half owned by Jersey Standard. No other Standard Oil unit competed with him for the lubrication of steel mills and tin plate mills in the United States. McCargo negotiated all contracts himself. Since central offices of steel companies remained in Pittsburgh even after steel plants had sprung up in other areas, he checked with his customers by

telephone or at his clubs if he heard from his subordinates that a mill was receiving grease from a competitor. Such contingencies rarely occurred, however, because Pennsylvania Lubricating made greases to order if sales could be obtained in no other way.[11]

Several changes were made in the corporate structure of lubricating units between 1892 and 1903. Three small companies—United Refiners, Inland, and White's Golden Lubricator—were liquidated between 1897 and 1902. In addition to the creation of the Borne, Scrymser Company and the Pennsylvania Lubricating Company, Incorporated, previously discussed, the Galena Oil Works, Limited, and the Signal Oil Works, Limited, were converted to corporations in 1897 and consolidated in the Galena-Signal Oil Company, capitalized at $10,000,000, four years later. The Colonial Oil Company, which sold both lubricants and top fractions abroad, made its appearance in 1901. The copartnership of Bedford et Compagnie was replaced by Bedford Petroleum Company, Société Anonyme Française, a corporation, in 1902, and during the same year the capitalization of the Vacuum Oil Company on Jersey Standard books jumped from $25,000 to $2,500,000. The West India Oil Company, a New Jersey corporation for consigning and selling petroleum products to Latin American buyers, appeared in 1902.[12]

The year 1894 witnessed the practical cessation of competition among Standard Oil lubricating specialists for railroad business. During that year the West Virginia Oil Company, in exchange for an annual payment of $10,000, relinquished all attempts to sell the lubricants to the Baltimore & Ohio Railroad Company, and the Vacuum Oil Company agreed to retire from the railroad field except in the so-called Eastern jobbing area of eastern Pennsylvania, eastern New York, and New England. The Inland Oil Company (until its liquidation) and the Waters-Pierce Oil Company continued to sell Galena and Signal wares on commission in their respective areas. During 1894 the Thompson & Bedford Department of New York Standard negotiated a new five-year contract for the exclusive sale of Signal's oils in the Eastern jobbing district and abroad, though in 1897 Galena began distributing some coach, car, and engine oils through a New York subsidiary—S. T. Baker Oil Company—and simultaneously inaugurated an active selling campaign in Europe.

By virtue of those new arrangements, further refinement of guaranteed contracts, and expansion in the number of mechanical experts and inspectors, by the late 1890's the Galena Oil Company and the Signal Oil Company were manufacturing an estimated 95 per cent of the five basic

railroad oils distributed in the United States, Mexico, and Canada. Lists of bills receivable in the accounts of the firms and of the later Galena-Signal Oil Company constituted a veritable roster of the railroads on the North American Continent.

One of Galena-Signal's markets was diminishing rapidly, however. As a New York reporter observed in 1898 after studying the *Railroad Gazette,* "Electric headlights on locomotives have come to stay."[13]

Competition between Standard Oil lubricant marketers did not entirely disappear after 1894. Swan & Finch Company, Vacuum, and Underhay Oil competed with Galena salesmen for the business of New England railways in cylinder oils and greases. Galena and Vacuum also came into competition in selling oils to some European railroad companies and to North Atlantic steamship companies.

The Thompson & Bedford Department of New York Standard, which specialized in selling paraffin oils and waxes, made few major changes in its methods after 1892. It disposed of products either on commission or on its own account from Jersey Standard and other refineries in the group. Within the United States, Canada, and Mexico it sold direct or on consignment to owned outlets of Standard Oil interests—New York Standard, Underhay, Eastern, Bushnell, Imperial, and Waters-Pierce. Its offices in the United Kingdom were absorbed by Anglo-American and that in Paris by Bedford et Compagnie, John H. Usmar and J. G. Macgowan being taken into the respective managements. Outside Europe, sales were made largely direct to merchants, though considerable amounts were dispatched from New York and Philadelphia on consignment. By taking over the management of a company in Buenos Aires—Compañía de Petróleo del Rio de la Plata, Limitada—in 1895 to straighten out the business, the Thompson & Bedford Department operated the first South American branch of a Standard Oil unit until the office was taken over by the Colonial Oil Company in 1902.[14]

In domestic operations Vacuum Oil set the pace for all other Standard Oil marketers in improving and applying sales techniques. After 1894 Standard Oil wholesalers and jobbers distributed Vacuum products throughout all the United States except in the Eastern jobbing district, where company salesmen handled the task themselves. Everest and his associates adopted excellent brand names and trade-marks—Mobiloil in 1901 and Gargoyle in 1904, for example. Vacuum was also second to no other Standard Oil unit in the use of packaging, especially of attractively decorated cans of appropriate size for easy handling. Traveling represen-

tatives sold cylinder and spindle oils, which had been greatly improved by 1899, to industrial establishments by sample. After the initial orders, "mechanical experts" followed with advice as to the proper type of lubricants and with supervision of their application. Vacuum men could get no nearer the ultimate consumer.

No later than 1903, Vacuum began employing Indiana Standard and other Standard Oil units to manufacture oils under Vacuum's secret formulae and processes, all products to bear the Vacuum trade-marks and brands. By this method, adopted after a large fire at the Rochester plant, managers of Vacuum decentralized manufacture and reduced transportation costs of marketing.[15]

Of course, Vacuum Oil marketers were not the only Standard Oil salesmen to forward merchandising activities. Wholesaling companies in the Standard Oil group also stepped up their efforts to sell lubricants. In June, 1898, for example, at the usual semiannual meeting of salesmen in the Southeastern Division of Jersey Standard, a district bounded by Baltimore, Charleston (West Virginia), and Florida, seventy-eight men discussed the types of oils to recommend for specific machinery and exchanged ideas on the best methods for effecting sales.[16]

Companies other than Vacuum in the Standard Oil group also expanded the number and use of "mechanical experts." These men were not salesmen but consultants who advised railroads and factories in the choice and use of the most suitable lubricants. The salaries and expenses of these roving consultants were divided among those companies chiefly concerned with the manufacture of lubricants—Atlantic, Solar, Ohio Standard, New York Standard, Jersey Standard, Vacuum, and Galena. The last-named company, having the greatest interest, paid the greatest amount.[17]

As early as 1892 Standard Oil managers established the Specialty Department to push sales of products usually classified as "shelf goods." Like so many other organizations with specialized functions for the Standard Oil group, the Specialty Department was set up in New York Standard, although the expense was shared by the other firms interested. At first selling only in New York and New England, the department later carried its ideas to all Standard Oil domestic jobbers. It sold chiefly in packages to stores, and the variety of its commodities was great. Among other products of petroleum, it marketed candles of many sizes and colors for diverse purposes, axle greases of several kinds, including the famous Mica brand, and harness oils.

Household items were made appealing by advertising directed to house-

wives. The Specialty Department carried on an intensive advertising campaign to sell Parowax, the brand name registered by Standard Oil for paraffin wax, which was sold in as small as one-pound quantities in paper cartons. "Paraffin Seal your Jelly" was a slogan accompanying a picture of the familiar American jelly jar. Excelsior Cheese Coating was praised: "It is Odorless, Tasteless, Clean, Inexpensive, Easily Applied and *does not* become Rancid."[18]

Advertising was not new to Standard Oil managers, but after 1892 they showed an increased awareness of its power to develop the market. Expenditures by many Standard Oil companies for this purpose rose considerably, and more originality was displayed. In 1898, for example, the Thompson & Bedford Department distributed a miniature oil barrel of white metal to hold matches on the desks of industrialists and to serve as a reminder of where to buy lubricants for their increasing needs.[19]

The outstanding development in marketing lubricants and waxes after 1892 was the more rapid extension of American techniques to foreign lands and the general expansion in the volume of products sold. Galena, Signal, Vacuum, and the Thompson & Bedford Department all actively participated in the movement, which was characterized in the main by an attempt to get as near the ultimate consumer as possible.

Charles Miller began to give more attention to foreign sales of Galena and Signal oils in the late 1890's and went to Europe in 1904 to open an affiliated plant in Alsace. Five years later the Galena Oil Company, Société Anonyme Française, was authorized to buy the necessary raw materials from the Galena Oil Company in Pennsylvania, to use its secret processes and the famous Trigram trade-mark, and to manufacture for the markets of France and Algiers. Alert salesmen had long since persuaded some of the French railroads, including the Nord (the "Pennsylvania of France"), to use the well-publicized Galena and Signal oils.[20]

After 1894, when Vacuum confined its direct selling in the United States to consumers in the Eastern jobbing district, C. M. Everest and his associates proceeded to create an almost world-wide manufacturing and marketing organization. They expanded the number of agencies, built manufacturing plants in several countries, and created a number of corporations affiliated with the parent Vacuum Oil Company. (See Table 44.)

Most of the affiliates of Vacuum Oil were built on agencies established earlier. In 1899 representatives of the company incorporated affiliates in France, Austria, Hungary, and Germany. The new company chartered in Sweden in 1900 was followed by two others in England and Italy the next

year. The opening of an office in Moscow in 1901, and the extension of sales to other Russian cities, led to the establishment of an affiliate, which, like several of the others, added nationals of the country to the nucleus of Vacuum's own experienced salesmen.[21]

These companies, or the preceding agencies, erected a series of compounding plants and refineries, chiefly after 1899. A compounding and blending unit was built at Millwall in England in 1895 and a complete lubricating oil works at Birkenhead in 1904. At Schulau on the Elbe the German Vacuum firm established a refinery which by 1907 was turning out a wide range of products, though small in quantity, from Hanoverian and other German crude oils. Similar manufacturing units of the Hungarian company at Almas Fuzito and of the Austrian unit at Dzieditz soon swung into operation. All foreign plants, presumably including the one reported to have been established at Riga, utilized the secret formulae and processes originally developed at the Rochester plant of the Vacuum Oil Company. By setting up foreign plants Everest and his associates avoided high tariffs on imported lubricants and, being nearer to consumers, were able to satisfy the requirements of buyers more efficiently.[22]

Not content with Europe alone, Vacuum Oil Company maintained salaried agents or affiliates on other continents. A very active company was formed in Australia in 1904, and four years later one in South Africa. With more than sixty employees, the Melbourne office outranked the London one by 1911, and branches were organized in Sydney, Adelaide, Freemantle, Brisbane, and other cities in Australia and New Zealand.

By that date, through its corporations and agencies Vacuum Oil was marketing at the four corners of the earth. From some twenty main foreign stations, including Cape Town, Buenos Aires, Bombay, Kobe, London, Stockholm, Budapest, Cairo, and Lisbon, its salesmen went out to hundreds of cities. They also marketed lubricants for other members of the family, including Swan & Finch Company and the Pennsylvania Lubricating Company, Incorporated.

The Vacuum Oil Company sold a wide range of lubricants but specialized in serving internal combustion and steam engines. The parent and its affiliates catered to customers operating steamships, Diesel motors, automobiles, airplanes, and factories. In 1904 the Rochester company got a big marine order when C. E. Bedford persuaded DAPG to buy all the lubricants for its fleet from Vacuum. At the Motor Show in England in 1909 Vacuum displayed seven grades of lubricants for automobiles.[23] As earlier, the company emphasized its packaging in barrels, half-barrels, drums,

and lithographed tins; the tins were provided free and were not returnable, thereby emphasizing the safety of obtaining high-grade lubricants in sealed containers.

Management continued to stress the supplying of factories directly; to meet the special needs of each industrialist, trained salesmen gave free demonstrations coupled with expert advice. American know-how, as well as lubricants, was exported all over the world through the affiliates and branches of Vacuum. The opening of its office in Moscow in 1901 and the extension of sales to other Russian cities was interpreted by outsiders as illustrating the fact that the country which had pioneered in manufacturing petroleum lubricants had failed to keep up with the demands made by high-speed motors and compound engines.[24] However that might be, the success of Vacuum Oil, both at home and abroad, appears to have depended on many factors—quality of products, emphasis on packaging, advertising, and a large sales force equipped to give expert advice on using all products sold.

Several changes occurred in the European arrangements of the Thompson & Bedford Department of New York Standard, which continued to serve as the export sales agency for lubricants and wax derived from paraffin oils by Standard Oil refiners. Three corporations served as its chief outlets in Europe. The Bedford Petroleum Company, S.A.F., succeeded to the business of Bedford et Compagnie as the seller of lubricants and wax in Western and Southern Europe. Anglo-American had acted as an agent in the United Kingdom for some years in the 1890's, but because of the income-tax administration it ceased selling on commission and bought and sold lubricants and waxes on its own account.[25] One managing director of this company, Colin Strong of Manchester, gave special attention to this important phase of his company's business in the largest foreign market for these American products.

In 1906, DAPG took over Leo Oppenheim and his agency, which for more than a quarter of a century had marketed for Thompson & Bedford Department in Central, Northern, and Eastern Europe. The consolidation had several advantages: it facilitated arrangements for shipping pale lubricating oils in DAPG's tankers, eliminated payments to outside companies for storage, and permitted the pushing of sales through DAPG's efficient distribution system. While visiting Europe some four years later, F. H. Bedford made the union even closer by arranging to transfer the main office for selling lubricants from Frankfurt am Main to DAPG's Hamburg headquarters. By 1911 two dozen branches in cities in Germany,

Austria-Hungary, Holland, Denmark, Sweden, Norway, and Russia sold upward of forty types of lubricants and more than a dozen classifications of wax.[26]

DAPG modernized the method of marketing Standard Oil's lubricants and the volume of business rose rapidly. Since most of the sales were direct to manufacturers, about 75 per cent of them were on a sixty- to ninety-day credit basis. More important, from 1906 on, special tanks, some of them equipped with steam coils to handle heavier oils, provided storage for lubricants in bulk. Shipment in tankers and tank cars was pushed on account of economies in handling and the scarcity of oak barrels in Germany, but the method was satisfactory only for the pale oils. Because of difficulty in cleaning tanks and stimulating flow, the technique was not so suitable for carrying black oils and cylinder oils. The latter, so important to the rapidly growing German industry, were manufactured only to a limited extent in the country and DAPG imported an increasing quantity. The company also took over the marketing of the lubricants of Borne, Scrymser Company and by 1911 was delivering in all more than five times the quantity that had been sold six years earlier.

Some of the experiences of the Lubricating Oil Department of Bedford et Compagnie (later Bedford Petroleum Company, S.A.F.) illustrate the adjustment to the customs of various markets, the simultaneous attempts to standardize business techniques, and the infinite capacity of the central office to watch details. This agency marketed some forty-one types of lubricating oil and thirteen classifications of paraffin wax in France, Alsace, Algiers, Luxemburg, Belgium, Switzerland, Spain, Portugal, Italy, Greece, Romania, Bulgaria, and Turkey (in Europe and Asia). The method of selling varied: Bedford et Compagnie sold on commission through its house in Paris and its branches in Milan and Antwerp; it also sent out traveling salesmen, and in some cities had its own special agent, often a local merchant who sold consignments on commission. When an American auditor examined the books of the Lubricating Oil Department of Bedford et Compagnie for 1894, he remarked that credit terms were being given beyond the thirty days' drafts customary in the internal trade of France. He was told that this "custom" even in France was "almost an exception." While customers in Brussels remitted regularly in thirty days, those in Italy and Spain required ninety days, those in Greece four months, and even then some debts were postponed.

After struggling through the accounts of a bookkeeper who lacked any sense of consolidations and failed to show the profit and loss on each of

the fifty-four separate items, the accountant wrote six pages of careful advice. He recommended that traveling salesmen give itemized expense accounts and detailed reports of sales, that the voucher system be thoroughly adopted, that the purchase of office supplies be centralized, and that the manager, Macgowan, be given an office manager to assist him. When the ambitious John J. Hoff was promoted to fill this post, another "valuable and faithful" man was on his way up through routine jobs well done.[27]

During the nineties, at least, American paraffin manufacturers, represented by E. T. Bedford, continued to come to annual understandings with the Scotch Mineral Oil Association and the Candle Makers' Association. The interests of the contracting groups differed greatly; with the lower cost of raw material in the United States, with the increasing output coupled with the desire of the marketers to find an outlet, and with the continued depressed state of the Scotch shale industry in these years, the parties found it more difficult to reach or to keep agreements. Early in 1892 the Scotch shale producers were reported as agreeing to reduce their output 10 per cent and to lower their price on the Continent. As mentioned earlier, at about the same time the inventive manager of the Broxburn Oil Company, Limited, Dr. Norman Henderson, sold the American rights to his wax "sweating process" to Standard Oil. This and other improvements increased the output and quality of American paraffin, and it gained a large market abroad, the biggest segment of which was in the United Kingdom.[28]

By 1909, Standard Oil also entered a quota arrangement on wax with Burmah Oil and Royal Dutch–Shell in the Far East. The agreement provided that Burmah Oil and Standard Oil on the one hand and Royal Dutch, also acting for Shell and Dordtsche Petroleum, on the other, were to divide equally the sale of the first 2,200 tons of wax disposed of each month, the East Indian manufacturers to have seven-eighths of the next 800 tons per month.[29]

During the years from 1892 to 1911 Standard Oil manufacturers and marketers greatly expanded their production and sale of lubricants and waxes. Total deliveries of lubricating oils by Standard Oil refineries to home trade in 1906 were 3,274,406 barrels. Of this amount, 1,926,560 barrels were sold by wholesalers and jobbers of the combination in the United States and Canada, which was a marked increase over the 1,098,150 marketed by them in 1898. The figures indicate, however, that a consider-

able proportion of total sales was made direct to large buyers. During the same year Standard Oil's exports of lubricants (2,515,547 barrels) constituted 72.8 per cent of the total sent out of the United States. The comparable figure for wax exports was 88.3 per cent. Standard Oil's world sales of wax increased from 265,605 barrels of 280 pounds in 1892 to 860,687 in 1907.[30]

Standard Oil executives took great pride in the part they had played in improving the quality and expanding the market for lubricants and waxes, but at least one of them expressed a lament often heard from pioneer organizers of large-scale operations. In order to create the market, said E. T. Bedford in a letter to M. F. Elliott in 1907, "we had to create facilities which did not exist and do an amount of work that no one but those directly in the employ of the company could do." Competitors, he thought, "did not have the facilities, nor the energy, nor the ability" to develop a large market. By selecting the best markets and concentrating sales on high-quality products, however, Standard Oil's rivals, in Bedford's opinion, were able to dispose of 100 per cent of their manufactured goods at better profit margins than members of the combination, which often could sell only 80 per cent of their output.[31] Nevertheless, records indicate that stockholders of Jersey Standard gained much from the efforts of the specialists in manufacturing and marketing lubricants and waxes.

Chapter 17

Producing and Refining in Europe and Asia

At the time that Jersey Standard became the parent of the combination its managers were devoting increased attention to their foreign policy. For a decade Standard Oil had held shares in several foreign marketing companies. It had made a beginning in searching abroad for production and had undertaken refining near a few foreign markets. At the beginning of the twentieth century the combination faced new competitive conditions abroad, a factor which encouraged its managers to increase appreciably the extent of its participation in foreign operations.

Conditions in the world's petroleum trade changed rapidly in the first years of the new century; not all the developments were new, but the increasing speed of change was significant. The rate of growth of new petroleum fields was most pronounced in Europe and Asia. Competitors of Standard Oil gained greater strength, in part through forming powerful combinations. The relative position of Jersey Standard and its affiliates was challenged as never before. In Europe, especially, the pattern of demand for petroleum products shifted; exports of American kerosene rose slowly to a peak in 1908, then declined for two years. The demands for petroleum products other than kerosene expanded spectacularly and created new problems of supply.[1]

THE EXPORT TRADE COMMITTEE AND ITS SUPPLY PROBLEMS

The group of Standard Oil men who had foreign marketing as their specific responsibility was a rapidly changing one. The Export Trade Committee at the beginning of the century was composed of men long in service. Within a few years retirement and death carried off several of those who had pioneered in Standard Oil's foreign business in the 1880's. Since the function was an expanding one, promising young men, usually those who had shown marked ability in domestic marketing, were chosen to obtain experience in foreign trade. By the middle of the decade leadership was in their dynamic hands.

The number of men who met as the Export Trade Committee was enlarged, and the members specialized in areas rather than in products, as the members had done earlier. Standard Oil's increasing direct participation in foreign marketing in many countries and its new relationship with affiliates, discussed in the following chapter, appear to have favored this reorganization. In 1906, for example, the men who consulted on foreign trade and the regions in which they specialized were: William Donald, Germany; Walter Teagle, United Kingdom; Walter McGee, Italy, Straits Settlements, and Java; W. E. Bemis, China; R. H. McNall, Japan, Korea, Australia, and New Zealand. F. D. Asche, who succeeded Livingston Roe, Jr., as secretary of the committee, later gave special attention to Scandinavian countries. Representatives of Vacuum Oil Company, whose foreign activities were expanding rapidly, met with the committee regularly.[2]

Many other changes were made in personnel in the years after 1906. Two of the vigorous marketers who had gone into foreign trade early in the century died prematurely. The death of E. C. Halsey in 1906 was followed two years later by that of William Donald, who had shown marked ability both to work with foreign affiliates amicably and to get things done. From time to time other men contributed their skills for short periods to the growing responsibilities of the committee.

Members of this group and many other men played important parts in the numerous negotiations carried on abroad. For the first years of the century James McDonald, a managing director of Anglo-American, was the chief contact man with Continental affiliates. W. H. Libby continued as the chief negotiator of agreements until about 1905. After that date he facilitated operations by drawing up memoranda on past developments to instruct younger men like Teagle, by preparing succinct statements of the possibilities before Standard Oil in difficult situations, and by composing his dignified and flowery letters to the State Department of the United States.

On the Big Board the subject of foreign policy was frequently discussed, but only a few memoranda preserve the contributions of the individuals and the reasoning of the group. Archbold and Barstow were directly concerned with foreign production; W. H. Tilford and Moffett contributed many ideas on marketing from their broad and successful experience in the United States; C. M. Pratt took a special interest in sales for export; and after 1909 Teagle added his experience to the deliberations of the board.

The supply problem for the Americans was a changing and complex

one over the period from 1899 to 1911. Early in the century, when the output of American crudes yielding a high ratio of kerosene was declining and new fields had not yet come into production, Standard Oil experienced an actual shortage of products. Exports of kerosene to Europe were about one million barrels less in 1903 than in the previous year, in part for lack of adequate supplies; marketers were discouraged from pushing sales.[3] Within a few years, however, the supply problem assumed a different form; unprecedented quantities of crude petroleum were produced in the United States. To meet the large home market for gasoline, Standard Oil refiners had to process an increasing volume of crude oil. With relatively inflexible equipment designed to maximize manufacture of kerosene, the additional throughput resulted in the necessity of finding outlets for the growing output of illuminating oil in a period when domestic consumption, and that of the chief markets, at first was failing to increase rapidly and then actually declining in competition with gas and electricity. While supplies of kerosene at times became burdensome, those of gasoline, consumed at an increasing rate at home, were neither sufficient in quantity nor of a quality to meet the needs of affiliated marketing companies in Europe. Standard Oil marketers were met by the problems of obtaining suitable supplies for some markets and of securing markets for others. The nature of the problems and their intensity differed over the decade.

The policies of Standard Oil in relation to its foreign business are discussed under three general classifications. To improve its position abroad Standard Oil took an increasing interest in foreign production and refining. At the same time it extended its marketing operations by establishing new affiliates and agencies and by developing a closer contact with those acquired earlier. The third method of approach was in the arena of marketing itself, the subject of a subsequent chapter.

Executives of Standard Oil had many motives for participation in producing and refining abroad; different purposes gained weight from time to time. Gleaned from stray remarks in correspondence and by inference, the development of the executives' reasoning is nonetheless clear.

In the years from 1900 to 1903, when the production from older fields in the United States was declining, an actual scarcity of petroleum and fear for the future drove Americans to a vigorous search abroad. Newer areas in the United States had not been tested, and uncertainty existed as to the leases in the promising Indian Territory. Some producing regions in Europe and Asia, moreover, beckoned on their own merits. In 1903

James McDonald reported to Asche that he had told a group of European buyers that Standard Oil was not going out of business "by reason of any shortage of American oil" and that it intended to continue the "distribution of oil (be that oil of the production of the United States, or any other country)."[4]

Even when the production in the United States rose at an unprecedented speed in the last half of the decade, Standard Oil men had several reasons to produce and refine in foreign countries. In some areas special competitive conditions favored the policy. Producing and refining abroad would reduce Standard Oil's own outlays for transportation, tariffs, and other purposes. The combination would be competitively stronger with cheaper oils to sell; it could enter the markets from which it had been excluded by prohibitive tariff barriers. Also, the products of a national company, even one financed by foreign capital, had sales appeal, and a refiner near a market was in a position to cater to its specific needs. Engaged in producing and refining abroad, Standard Oil would have a more exact knowledge of rivals' costs; established in various fields, it would have a greater bargaining power in negotiating agreements with competitors.

Standard Oil already had precedents for increasing its participation abroad in producing and refining. Ohio Standard had financed Corrigan's refinery in Galicia in the 1870's. In the following decade Archbold & Conill had started refining in the West Indies, and Waters-Pierce had established small refineries in Mexico. In the 1890's the purchase of an integrated company, The Imperial Oil Company, Limited, had expanded Standard Oil's participation in Canada. Deutsch-Amerikanische Petroleum-Gesellschaft and American Petroleum Company had made an investment in a refinery in Germany. As discussed in an earlier chapter, a number of factors had led Standard Oil men to obtain and operate two refineries in France in the 1890's. During the same decade Standard Oil had sent men abroad in search of oil and had tried to establish itself as a producer and refiner in the Dutch East Indies.

FOILED IN ASIA

After 1898 Standard Oil men devoted renewed attention to establishing integrated operations in Asia. Both the development of local petroleum resources, especially those in the Dutch East Indies, and the import of kerosene in bulk from Russia by Shell had created formidable competition for the American organization in the 1890's. With lower costs of pro-

duction and shorter lines of transportation to Eastern markets, these competitors, sometimes protected by tariffs, were able to win many customers from American kerosene. Standard Oil had taken several moves to hold its position before 1899: it had established its own selling agencies in important Eastern centers under New York Standard; it had purchased some cheaper Russian kerosene for Oriental markets; its production experts had undertaken the search for petroleum concessions; and it had attempted to buy established companies in the Far East. When the attempt to acquire production in the East Indies failed, Standard Oil men moved into producing and refining on the Pacific Coast of the United States, as noted in Chapter 12, but they did not diminish their campaign in Far Eastern countries.

At the same time that Standard Oil embarked upon its California venture, it launched an integrated operation in Japan. As soon as that country amended its mining law early in 1900 to make it possible for foreigners to organize a production company, J. W. Copmann, New York Standard's marketing agent in Yokohama, cabled to New York for authority to lease land. After getting the charter of New York Standard amended to permit it to hold stock in a foreign company, the managers took prompt action to give financial support to a new corporation. J. H. Fertig, J. W. Copmann, K. Erichiro, and others organized the International Oil Company, Limited, in November, 1900, with an authorized capital of ten million yen.[5] Almost all of the sum subscribed, half of that authorized, was supplied by the Americans. Fertig applied his abilities in production and with the help of American drillers completed many wells in Hokkaido and other producing areas. The company also erected at Naoetsu what was reported as the "best equipped and most modern refinery" in Japan.[6]

The best refinery, however, needs raw materials. International Oil's crude production did not satisfy a third of its refinery's capacity, and it met active competition from buyers of crude for other Japanese refineries. In fact, the total annual output of crude petroleum in Japan had not reached two million barrels by 1907. The oil was also low in the desired qualities for manufacturing kerosene. Attempts to obtain crude supplies in the Dutch East Indies for the Naoetsu Refinery were not successful, and apparently Standard Oil preferred to continue to import refined products rather than to bring raw materials into Japan from California. Whatever factors besides the crude oil situation determined the decision of Standard Oil to withdraw from Japan, after seven years of extensive effort it sold out to the Nippon Company.[7]

In 1901 Standard Oil turned its attention to Burma. Here an ancient petroleum industry, revitalized in the 1870's, had made more rapid strides after the annexation of Upper Burma to India and the formation of the Burmah Oil Company, Limited, in 1886. Incorporated in Scotland, Burmah Oil exported to Rangoon Scotch capital, managers, some workmen, and methods learned in the shale oil industry. Canadian and American drillers also helped to increase the crude oil production, although native Burmese continued to dig wells in the fields of Yenangyaung and Yenangyat. The production had been more than trebled from 1893 to over a million barrels in 1901. More significant than the small provincial market was the vast potential one of India in which Burmese products, protected by the tariff of 1888, had an advantage.[8] If the Americans could become established in Burma, they could not only compete more satisfactorily for the Indian market, but with less expensive production and a short water haul to other markets, they would be in a stronger position for trade in the whole Eastern Hemisphere.

Apparently with a minimum of investigation, the managers of Standard Oil suddenly made up their minds to enter the petroleum industry of Burma early in 1902. They selected as the medium the newly organized New Jersey corporation, the Colonial Oil Company, which had a broad charter authorizing it to carry on all phases of the petroleum business all over the world. "We have decided to build a Burma refinery, sending men and material from here at the earliest possible moment," the managers of Standard Oil in New York cabled Samuel Comfort, New York Standard's agent in Calcutta, on January 17, 1902.[9] "Can you go there immediately to take necessary steps? Effort should be made to prevent present interest from tying up producing." The cable advised immediate action on both purchasing crude oil and obtaining producing property.

This was the first of more than 160 cables exchanged between Standard Oil Company and its representatives in India and Burma within the next thirteen months. Soon the tone of the messages was less certain. Comfort suggested that Standard Oil postpone building its refinery until it had production under way, since all the proven territory was either in the hands of competitors or its yield promised to them under long contracts. He advised his company not to send tools, rig-builders, and drillers until he and J. C. Machale, the production man who had come to help, met with some success in getting leases.[10]

The Burmese government adopted unusual methods to keep the Americans out. First it refused to grant the Colonial Oil Company a concession

on government land. Comfort, however, advised New York not to ask the State Department to instruct the American Consul at Rangoon to assist because the holder of this office was a known associate of a rival company. Comfort then attempted to obtain leases from private owners of property, but the government issued a new order forbidding the alienation of petroleum property whether acquired by grant or purchase.

Top executives of Standard Oil expressed frustration at the difficulties encountered and took more vigorous steps. "Much annoyed over delay," they cabled, "we are unhappy over situation."[11] While they sent George F. Southard to Burma to make preparations for a refinery, as he had done in 1892 in Rouen, France, W. H. Libby traveled via London to the East to handle relations with the governments concerned.

The attempts of Libby and other representatives of Standard Oil in 1902 and 1903 were many and varied. Libby conferred with James McDonald, a managing director of Anglo-American, and, after consultation with New York, this English company made a separate application for a concession in Burma. It was refused. Libby had an interview with the American Ambassador in England, Joseph H. Choate, and some unavailing correspondence passed between the latter and the British Foreign Office. Libby went to Burma, and, with the aid of the new American Consul at Rangoon, conferred with Burmese officials, but the Viceroy of India, Lord Curzon, refused Libby's request for an interview. The members of a special committee of the Bengal Chamber of Commerce, Calcutta, to which Libby presented his case, were more direct. Among the reasons they gave for not interceding was that they felt the government of India was wise in maintaining its right to grant or refuse concessions on its land, and with a pleasing frankness admitted that those of their members interested in the oil trade of India and Burma would naturally oppose the granting of any concessions to Standard Oil or its affiliates. Libby returned to the United States and, with Dodd, again interviewed Choate, who assured them there was no use making further appeals while Lord Curzon remained in office. The British government had disclaimed discrimination against Americans; one of the companies to which it refused concessions was English![12]

In the meantime extensive negotiations by Standard Oil with stockholders of a five-year-old concern, The Rangoon Oil Company, Limited, had come to nothing. This was the only other sizable petroleum company in the Burma field outside of Burmah Oil. Young John F. Archbold thought it held very promising producing territory; it also had other assets, includ-

ing a comprehensive charter and an able Irish field manager with experience in Pennsylvania. One of the obstacles to purchase was a stipulation in its statutes restricting the sale of its stock.[13]

Both Standard Oil and those who opposed its entry into Burma appealed to public opinion. Libby declared that the "press and public innuendoes" as well as the negative attitude of the Viceroy "must have been derived from sources not wholly disinterested."[14] Indeed a somewhat garbled account of Texas' inhospitable policy toward Standard Oil appeared in the Indian papers. On the other hand, Southard's relations with producers eager for another buyer in the market had been friendly. One hundred and thirty-six *twinzayos,* hereditary oil-well owners of Yenangyaung, petitioned the government in December, 1902, to give concessions to a new company. Perhaps to counter this attitude some of the stock of the Burmah Oil Company, Limited, was sold to native producers in Burma. Libby's letters on various phases of the struggle were widely published in America and India.

Even before 1902 had ended, Standard Oil men could see that they were in for a long wait in Burma. Southard was offered his old position back at the Solar Refining plant at Lima, since Van Dyke had been transferred to Atlantic Refining. Other men were left in Burma to watch developments and report to New York.

In 1905 Standard Oil made another attempt to enter Burma. It decided not to become a producer but merely to build and operate a refinery at Rangoon and to put up storage tanks for bulk distribution. Both applications were refused, and the result of the appeal to Lord Curzon could almost have been predicted.[15] Standard Oil became neither a producer nor a refiner in India. Perhaps it was but cold comfort that Marcus Samuel of The Shell Transport & Trading Company, Limited, indignantly addressed himself to members of Parliament in a committee room that summer on the exclusion policy of Burma.[16]

In the meantime, Archbold and his associates never ignored the possibility of acquiring production in the Dutch East Indies, which outranked all other Far Eastern areas in steady rate of growth of output after 1902. Executives at 26 Broadway kept informed about developments in Java, Sumatra, and Borneo, considered offers of property made to them by various men with concessions in the islands, and undertook a number of negotiations.[17] Some of these were followed hopefully for considerable periods, as that with Moeara Enim had been earlier. Because the policy of the Netherlands government made it virtually impossible to obtain

new concessions in the Indies after 1904, Standard Oil attempted to acquire an established Dutch company which met the nationality requirements of the mining laws. Standard Oil's negotiations with The Shell Transport & Trading Company, Limited, resumed in 1901, came to nothing. In 1905 Standard Oil considered buying another Indies corporation, Maatschappij Moesi-Ilir, after that company, needing money, had made overtures, but Royal Dutch soon achieved with this company a working arrangement similar to those which it had established with other producers in the Indies.[18]

In the same year negotiations had proceeded even further between Standard Oil and Shanghai Langkat, a company which had attracted the favorable attention of Fertig and Lufkin on their trip to the East in 1897. This producer, unlike many others in the area, had not sold its products through The Asiatic Petroleum Company, a marketing company activated in 1903 and in which Royal Dutch, Shell, and the Rothschilds participated. Shanghai Langkat had sold some of its naphtha to Standard Oil. American experts went to the Indies to evaluate the properties of the Dutch company and Libby negotiated in Holland, but Royal Dutch concluded an agreement with this comparatively large producer, and Standard Oil lost this source of supply of naphtha in 1910.[19]

Competition between Standard Oil and Asiatic, which at times had been modified by agreements, rose to a new high in 1910 and Standard Oil made more vigorous efforts than earlier to become established as a producer in the Dutch East Indies. Stoop's successful Dordtsche Petroleum Company at Java attracted the Americans. Teagle thought the price asked by Stoop was too high, and negotiations dragged into 1911. Royal Dutch bought the company. In the meantime, Standard Oil had arranged with its own affiliate in Holland, the American Petroleum Company, to organize a company in the Netherlands to meet the mining laws which restricted the granting of concessions to Dutch citizens and corporations.[20] The history of the operations of Jersey Standard's affiliate, Nederlandsche Koloniale Petroleum Maatschappij, organized in 1912, belongs to a later period.

By 1911 Standard Oil could look back upon eighteen years of effort to obtain concessions or to buy an operating company in the Dutch East Indies without any success in terms of its own production. It obtained oil from the islands only when it bought semirefined products. However, given the complicated relationship between the marketing competitors—Asiatic and Standard Oil—the many weary months of negotiation were

probably not without some fruits. At times there was comparative peace between the rivals, and Asiatic supplied Standard Oil with large quantities of crude naphtha needed for the latter's European markets.

NAPHTHA RERUN PLANTS IN GERMANY

The market for gasoline and other products from the naphtha cuts of the refineries was a promising one in Europe in the first decade of the century, but it required, especially in Germany, careful attention from managers of Standard Oil. Though automobiles, trucks, busses, and "naphtha launches" were using appreciable quantities of gasoline, the industrial consumers in Germany continued to account for more than half that national market for gasoline and naphtha during the first years of the twentieth century. The consumption of Germany was growing rapidly. In 1903 the managers of Standard Oil, although faced by current scarcity of supplies, could see clearly that they must push their sales in this important market in order to meet the strong and well-organized competition with which they were faced; otherwise their own position for the future might be jeopardized.[21]

Standard Oil's difficulties in supplying its affiliates in Europe with gasoline and naphtha continued with variations throughout the decade. In the first years of the century the Americans lacked a sufficient quantity of light-gravity crude petroleum. Later, faced with growing demand for gasoline at home, Standard Oil was not always willing to sell abroad at prices low enough to satisfy its affiliates.[22] Moreover, throughout much of this period the quality of American gasoline and naphtha did not meet the standards of Europeans. Though American automobilists were willing to buy increasing quantities of "stove gasoline" in spite of its odor, Europeans not only wanted "the sweetest product possible" but called for a great variety of products under the general category of naphthas.[23]

In Germany the national suppliers catered to the needs of many industries which used gasoline or naphtha for cleansing or as a solvent. Manufacturers of rubber, varnish, and paint, textile factories, cleansing establishments, and chemical plants, including dyeworks, were large and "fussy" customers. In order to cater to this market at the beginning of the century some sixteen refineries or rerun plants in Germany manufactured a variety of products, classified by specific gravity or boiling point, under the name of "benzine" or "naphtha." Some plants, to meet specifications, turned out as many as twenty or more finished products,

ranging from rhigolene to the equivalent of the American 58° deodorized gasoline.[24]

Since only a small amount of crude oil was produced in Germany, the refiners imported crude petroleum or crude naphtha. Some supplies came from the United States, Galicia, and Romania, but in 1903 The Asiatic Petroleum Company got a strong hold on the market. Shell and Royal Dutch could supply the tankers to carry the Sumatra crude naphtha which suited the needs of the German plants. The able marketers of Asiatic contracted a supply agreement with the Vereinigten Benzinfabriken GmbH (hereinafter called the Benzine Syndicate), which included most of the refineries in Germany and held about 90 per cent of that national market. Asiatic sold the crude naphtha on a sliding scale determined by the prices received by refiners through their own joint selling agency.

The two Standard Oil affiliates operating in Germany had made some moves to enter the naphtha market in the 1890's. Following a meeting of the representatives of DAPG and the American Petroleum Company in 1893, they carried out their plans to convert a tanker to carry crude naphtha, to provide bulk storage at Nordenham, to purchase shares in the Petroleum Raffinerie vormals August Korff at Bremen, and to operate with the latter a three-cornered joint account for marketing its gasoline and naphthas.[25]

In general, however, by late 1903 the position of Standard Oil in the naphtha and gasoline market of Germany was weak and deteriorating. As Asche expressed the situation to McDonald: Standard Oil's "Asiatic friends" had a "monopoly of the business" and were making a "handsome profit."[26] Standard Oil's only part in the German trade was the 54 per cent interest which its affiliates held in the Korff Refinery and sales to that refinery of approximately 140,000 barrels of Pennsylvania crude petroleum annually. Korff obtained only one-fourth of the raw material for the plant's gasoline and naphtha output from Standard Oil, and, contrary to suggestions expressed by the Americans, remained a member of the Benzine Syndicate. Moreover, after Asiatic had built its own refinery at Düsseldorf-Reiholz, Korff's quota in the German market was reduced to about 15 per cent.[27]

In 1904 Standard Oil and its German affiliate decided to become more active in the German naphtha and gasoline market in spite of a threat from Henri Deterding. The manager of Royal Dutch intimated that if Standard Oil entered the German market for these products, he would

export to the United States. DAPG started a vigorous marketing campaign; it "did not mean a fight for show only."[28] Several Standard Oil marketers and an expert refiner went to Germany to study the situation with the managers of DAPG.

At first DAPG marketers made an unsuccessful preliminary move. They tried to woo the Benzine Syndicate away from Asiatic, but the refiners were satisfied with the good quality of the Sumatra crude naphtha and feared that if they did not renew the contract with Asiatic that company would add to its own refining capacity in Germany. They doubted whether Standard Oil could provide them with an adequate supply. The fact that Asiatic was making sales of gasoline in both France and South America lent weight to the rumors which were circulating about Standard Oil's short supply. DAPG decided, in consultation with New York, that the only way that it would be able to compete successfully in Germany was to strengthen its position by establishing refineries and marketing the products.[29]

There were several reasons for operating plants in different parts of Germany to rerun the naphtha fraction to make various types of gasoline and naphtha. Though the tariff on finished petroleum products entering Germany was high, crude naphtha to be distilled in Germany for certain industrial purposes entered free; this would apply to about 40 per cent of DAPG's anticipated imports. Standard Oil could not supply the German market with either the quantity or quality of gasoline and naphtha products required. The various German manufacturers had specialized needs. It was impractical to ship small quantities of several types of naphtha long distances, and the railroad rates were high on finished products. These, among other arguments, led to the decision to establish plants for redistillation of partly finished products in different parts of Germany where DAPG could watch and cater to particular industrial needs. Provisions had been made to purchase the required supplies of raw material from outsiders, including Royal Dutch.

While the plants were being obtained, DAPG put on an active sales campaign to improve its position. Though some supplies came from the United States, others came from Anglo-American, which produced special products for the Continental wool trade and was reported as distilling "a very sweet naphtha" at its works at Silvertown on the Thames. An indication of DAPG's success in pushing sales was the fact that, as Donald wrote, "competitors are even circulating the statement that our naphtha is not as good as theirs (and there is some truth in this if they mean odor).

They also say no matter at what price the DAPG offer they will always meet that price."[30]

By 1905 DAPG had strengthened its position as a manufacturer. The first step was to improve its relations with the Korff Refinery in which DAPG and American Petroleum were interested. The Korff plant, under the able management of P. F. Lubinus, ranked third in size among German refineries; it had excellent equipment for careful fractionation of its gasoline and naphtha; located at Bremen and established in the trade, it served a rich hinterland and was well known to a large number of customers. Korff agreed to give notice to withdraw from the Syndicate in 1905, to buy its raw material from DAPG, and to deliver to it the gasoline and naphtha products in return for a generous remuneration for expenses and a share in the profits of DAPG in marketing.[31] DAPG, with the aid of G. B. Gifford of Jersey Standard's Eagle Works, made plans to build another plant near the important industrial market of western Germany. In the meantime, DAPG leased and operated Chemische Fabrik Müngersdorf at Cologne-Braunsfeld.[32]

A sign of DAPG's growing strength in the gasoline and naphtha market in Germany was an agreement signed by it and the Benzine Syndicate in August, 1906. Shortly after Korff had given his six months' notice of withdrawal from the Syndicate, Asiatic informed Standard Oil, indirectly, that it was willing to make terms. The development of the oil fields in the Mid-Continent of the United States and the construction of a pipeline from Glenn Pool to the Atlantic Ocean undoubtedly influenced negotiations. Late in the summer of 1906 Rudeloff and others of the Syndicate, Deterding, the two Riedemann brothers who had succeeded to their father's place among managers of DAPG, and two Standard Oil men—E. C. Halsey and Teagle—negotiated terms of an agreement.[33]

The chief provision covered the division of the "benzine and naphtha" sales in Germany, Switzerland, and Luxemburg. DAPG was to have 25 per cent of the two signatories' total estimated annual market of 80,000 tons (about 786,000 barrels of 42 gallons); in excess of that amount it was to have 75 per cent up to 120,000 tons, after which the additional sales were to be divided equally. The contract included neither penalties for exceeding the quotas nor exact prices, but it set a minimum price and stipulated that if one party failed to sell its quota the other was to aid it, in part through price adjustment. The contract included a promise of a supply of crude naphtha by Asiatic to Korff and some stipulations concerning the length and amount of future sales. Since Asiatic was

marketing for Steaua-Romána, Societate Anonimă pentru Industria Petrolului, this agreement covered most of the suppliers of raw material to Germany.

The agreement was to run until 1910 but was canceled on July 7, 1908. Although no specific reasons for this conclusion are given in the correspondence, it was in line with other competitive developments in the world and also reflected the increasing strength of DAPG's position as a refiner in Germany.[34]

DAPG had continued to win approval in New York for a vigorous policy of extending its rerun plants in order to increase the output of products and to be nearer local markets. In 1907 DAPG leased part of the Schulau Works of the Deutsch Vacuum firm. Here, on the Elbe near Hamburg, DAPG processed partly finished imported material in bond under the supervision of the customhouse. In the same year the works which G. B. Gifford had recommended at Düsseldorf began operation. In 1906 Heinrich Riedemann had urged that DAPG establish a plant at Regensburg to process Romanian oil and to serve the southern German market. The Standard Oil managers in New York agreed, but, when the quantity of Romanian crude production for a time did not live up to expectations and alert competitors pre-empted barges on the Danube, Standard Oil favored dropping the project. Riedemann countered at once with strong arguments. He had obtained a concession from a municipality which had provided generous facilities; Bavaria, eager to foster local industry, would be disappointed if the plant was not built. Furthermore, DAPG's Korff, Düsseldorf, and Schulau plants, working "night and day," were unable to supply all the marketers' needs. Riedemann's eager sponsoring of the project resulted in the building of a rerun plant at Regensburg in 1911. A year earlier, DAPG temporarily began operating a plant at Brünsbuttelkoog, acquired with the purchase of the Deutsche Benzin und Öelwerke A.G., which had been organized by Munich banks and manufacturers of automobiles and dyes. Heinrich Riedemann's cogent arguments in 1911 that the Galicians must be met in the growing market of Berlin also brought approval of appropriations for a plant in that city.[35]

Not all the differences of opinion that had to be ironed out were between the German managers of DAPG and its chief stockholder, Jersey Standard; the usual differences in points of view between refiners and marketers were displayed at times. When Teagle, studying the German industry in 1903, reported that European techniques of refining were superior to American, C. I. Robinson declared that the method of distill-

ing used by Korff at Bremen was similar to that of Jersey Standard's Baltimore plant. He agreed, however, that in the United States naphthas were not so carefully cut into lighter and heavier products and that neither tankage nor separating devices were available for such differentiation, but he pointed out that the reason was that the domestic market did not demand such a variety of naphtha products.[36] This and other arguments did little to alter the views of the young and self-confident Teagle, who continued to insist that if the Standard Oil refiners would turn out a product suitable for the European market expensive redistillation abroad would be unnecessary.[37]

The American refiners continued to answer such criticism. They protested that they had varying crudes with which to deal, not the fine Sumatra product, and they could argue that even if their products did not meet the various testing paraphernalia used in Europe they met the Saybolt tests used for the American market. Heinrich Riedemann himself came to the defense of the rerun plants. He pointed out that, since the United States had no similar works, Teagle had nothing with which to make a reasonable comparison of costs of rerunning in Europe. The manufacturing expenses of the works in Germany carried the salaries of chemists who also contributed some of their skills to marketing. The fact that the local plants were small and made strenuous efforts to meet the exact specifications of customers increased their manufacturing costs per unit, but their location minimized transportation costs and helped to hold customers. Furthermore, the rerun plants had to turn out products in the ratio in which the sales department could sell them rather than to maximize the most valuable products. On occasion the refiners had their costs raised as a result of handling a variety of American crudes in place of the then superior Sumatra naphtha.[38] That the products sold well was the proof of the refining.

By 1909, however, the American refiners were helping to satisfy some of the market for gasoline in Germany. From the rapidly increasing supply of high-gravity Oklahoma crude they manufactured at the new Bayway Refinery, among others, a "Special Naphtha" (.707 to .708 specific gravity). The gasoline was given an extra acid treatment, which added to cost but reduced the odor and yielded a product satisfactory to many European motorists.[39]

As a result of various measures to obtain an adequate supply of products, and of marketing methods to be discussed later, the sales of gasoline and naphtha by DAPG grew rapidly. For a time in 1909 DAPG

again had an agreement with the Benzine Syndicate. Competition and price cutting flared up early in 1910, however, leading Heinrich Riedemann to complain that the rivals were not only selling below his company's official price, but below its actual price! Teagle sailed to Europe that spring and negotiated in London with Deterding; they reached an agreement for the British market, but any truce of that year was temporary and local. Negotiations failed to produce an understanding for the German market, and some details of the petroleum war of 1910 are discussed in Chapter 19. In 1911, however, DAPG marketed some eighty thousand tons of gasoline and naphtha, of which about three-fourths was processed in Germany. A second grade of gasoline, Autonapht, was imported from the United States. DAPG and American Petroleum together held at least 55 per cent of the German market.[40]

The establishment of rerun plants, as well as aggressive marketing and, at times, agreements with competitors, had strengthened the position of Jersey Standard and its affiliates in the important gasoline and naphtha market of Germany. Much of the crude naphtha, however, was purchased from companies outside the combination.[41]

STANDARD OIL CONSIDERS RUSSIA

In the meantime, Standard Oil had looked to Europe itself as a possible source of raw materials. Early in the century, when the combination was sending men out to investigate almost every promising foreign field, it sent several men to the Caucasus.

Russia attracted attention on several counts. Since 1898 it had been the world's largest producer. Its phenomenal gushers or "fountains" made costs of production lower than in the United States. For reasons discussed elsewhere, continuous distillation had been successfully adapted in its refineries. Improvements in transportation increased the exports from this area. By 1900 the Transcaucasian trunk pipeline carried products about 140 of the 560 miles from Baku to Batum,[42] and the exports of Russia accounted for about 35 per cent of world export trade in petroleum. For Standard Oil, Russian kerosene was both a serious competitor and a possible source of cheaper supply. The improvements in transportation and the favorable rates enjoyed on railroads to Eastern Europe enhanced both the threat and the appeal of Russian oil.

Standard Oil's veteran producer, C. F. Lufkin, posed the crucial question early in the century: "What is the best method for the Standard Oil Company to engage in the Russian oil business—having in view not only

the direct profits to be derived therefrom, but the advantages which might be secured for the protection of their [managers of Standard Oil's] American interests and World's trade, with the least hazard to capital?"[43]

The fact that the company made careful investigation of the Apsheron Peninsula in 1900 showed clearly that Standard Oil was seriously considering participation in the Russian industry. C. C. Campbell had already made a preliminary study and reported that several companies in Russia were willing to sell—at a price—and New York was "favorable to pursuing negotiations."[44] The experienced refiner, G. F. Southard, and Lufkin each made a careful separate evaluation of the properties of three firms whose plants would afford the basis for an integrated operation. As well they might be, the Americans were impressed by the production of the country and by the existence of numerous wells with tremendous flows, including some gushers which initially produced more than 100,000 barrels per day.

Even Lufkin, the producing expert, however, considered refining and transportation the best keys to entering the industry. He was discouraged by the large price put on petroleum territory offered for sale and by the system for leasing governmental land for high royalties expressed in a set number of kopecks per pood. In his opinion, drilling and bailing were both expensive. Lufkin felt that investment in producing property abroad generally took a long time to bring results. He fully appreciated the danger of depreciation of wells, either through depletion or the development of new fields, "while the value of refining property," he wrote, "comes near being a fixed quantity, becoming if anything more valuable when the producing business becomes depressed by overproduction and consequent low prices."[45]

Southard was adversely impressed by other considerations. Baku seemed to him very remote. Transportation was difficult; tank cars hard to obtain. These facts and the arbitrary character of the government caused him to conclude that investment in Russia was hazardous and that other fields were more attractive.

Standard Oil did not enter the Russian industry at this time, except as a buyer of products, but its managers continued to follow developments in that country. Russia was the largest producer of crude oil in the world from 1898 to 1901, when it reached its maximum for this period. Though gushers on the average were not so spectacular as those of an earlier day, they were phenomenal enough to make the United States Consul at Baku declare "ridiculous" the statements of the American newspapers that the

largest well in the world had been struck in Texas in 1901.[46] Exports, facilitated by combinations between refiners and exporters, rose to a high in 1904. At that time Russia accounted for about 38 per cent of the total exports to the world markets. The pipeline finally reached from Baku to Batum in 1905, but the year was not one for elation in the Russian oil industry.

Many unfavorable conditions harassed the Russian business. Its home market for kerosene had never been developed to any extent, burdened as it was by the poverty of the people, numerous middlemen, and a high excise tax. The fluctuating railroad rates were a disturbing factor in cost, and they had risen on oil traffic between Baku and Batum from twelve to nineteen kopecks per pood between January, 1900, and April, 1904. A new and more disruptive influence appeared in 1902, when the workers in some case and can factories at Batum, suffering from reduced employment, went on strike. Work stoppage came again in 1904, at the same time that trade to the Orient was being adversely affected by the Russo-Japanese War. The following year strikes with political aspects became widespread in the industry. Racial riots among the mixed population as well as incendiary fires and murders created havoc in the oil fields. Death and destruction induced Dvorkovitz to announce in his *Petroleum Review* in September: "The Russian petroleum industry for the present has ceased to exist." Total exports in 1905 fell to less than two-thirds of those in 1904, and the volume of kerosene had declined to an even greater extent. Never again in this period did Russia's oil trade rise to the old levels. In fact, in 1908 exports were estimated at 40 per cent of those five years earlier.[47]

Standard Oil warily watched the Russian industry make its gradual recovery after 1905. The government came to the rescue with the restoration of order, the reduction of transportation rates from Baku to Batum, and loans to producers. Many firms strengthened their position by consolidating or working together, especially for export trade. In spite of objections to the system of leasing on governmental land, new areas were opened up, and output from Grozny and Maikop in particular was added to the production of the old and new wells of Baku.[48]

Always interested in new areas, Archbold and his associates sent production experts out to investigate the new Russian fields in 1910. There was little to attract the Americans to Maikop, which had many difficulties.[49] A million dollars invested in Oklahoma, Illinois, or California seemed more secure than, and at least as promising as, an equivalent amount invested in a foreign country. Oil frontiers at home seemed more

attractive at the time and, though Standard Oil's hopes in Romania were high, developments in Austria-Hungary must have made the executives unwilling to risk activity in a country with so autocratic a government and so uncertain a history as Russia.

VACUUM OIL IN AUSTRIA-HUNGARY

Standard Oil's renewed interest in Austria-Hungary during the 1890's coincided with a general increase in investment there. In that decade the country's petroleum industry, though many years old, attracted additional capital and experts from many lands. In 1896 F. H. Oliphant, the geologist who often served Standard Oil as a consultant, gave a most favorable report on Galicia's oil resources. Like others, he suggested that the heavy Austrian tax on refined products could be escaped if the crude was shipped to Germany and refined there.[50] In fact, the possibility of the establishment of a German refining industry was widely rumored.

In spite of the rich prospects of Galician production, its very rapid increase in output soon resulted in one of its frequent crises. Late in 1902 the refiners in Austria-Hungary formed a committee to handle exports. In December its representatives met in Bremen with those of the Rothschilds, the Nobels, and Standard Oil—Wilhelm Riedemann's sons, Livingston Roe, Jr., James McDonald, and F. E. Powell. Nothing came of the meeting except a suggestion by the Galicians as to what should be their share of the European market, a proposition deemed unreasonable by the other participants.[51]

Given this particular situation, Standard Oil made a study of the industry of Austria-Hungary. Indeed, during 1902-1903, with the supply of crude oil short in the United States, Standard Oil dispatched production experts all over the world. Reports came in from Italy, Germany, and other areas, among them those from four specialists visiting Galicia.

C. F. Lufkin wrote a long report and made several suggestions. He dwelt on the difficulties of production in Galicia, the new geological problems which would have to be faced by Americans, the very high valuation placed on all properties, the many different languages which must be used, and the ignorance and depressed conditions of the laboring force. However, he was impressed by the great producing possibilities of the fields and by the progress made by that pioneering Canadian, W. H. McGarvey, whose integrated company, Galizische Karpathien Petroleum Aktien Gesellschaft (Bergheim and McGarvey to 1895), looked like a good prospect for purchase. Referring to the widow Backus story so often

circulated in the United States, and imitating Charles Dickens, Lufkin said of McGarvey: "Backus was willing."[52] Whatever negotiations were attempted, McGarvey did not sell; Lufkin's own proposal that Standard Oil should enter Galicia as a refiner was followed.

The Vacuum Oil Company served as the medium, and the timing of its activity was perhaps occasioned by increased competition. Vacuum Oil Company had already established affiliates and agencies abroad to expand its trade in lubricants, as discussed in Chapter 16. In 1904 the Galicians organized an export company, Aktiengesellschaft für Oesterreichische-Ungarischen Petroleum Produkte (hereinafter called by its familiar name OLEX). During the same year Vacuum Oil Company A. G., Vienna, chartered in 1899, increased its capital and with Vacuum Oil Company Reszvenytarsasag, a Budapest firm, built two refineries, one at Dzieditz in Austria and another at Almas Fuzito in Hungary. Their combined daily capacity totaled about 3,900 barrels by 1911. (See Table 43.) Four years earlier the acquisition of 40 per cent interest in Galizischen Rohol-Transport und Lager Aktiengesellschaft for storing and transporting oil widened Vacuum's interest. In fact, for a time Standard Oil marketers looked to Galicia as an important future source of supply of products for the European market.[53]

As the history of Vienna Vacuum unfolded, however, it proved to be almost as troubled as that of the empire in which it was domiciled. During the years following the entry of Vienna Vacuum into refining, the Galician industry experienced its usual crises, with the result that various groups took conflicting action to meet the situation. Production grew rapidly, but, burdened by heavy taxes and relatively high prices if not by great strides in electricity or gas, the domestic per capita consumption of kerosene remained almost static. Vacuum and a new refining corporation financed by French capital, Limanowa Company, declined to accept the small quotas in Austria-Hungary offered by the strong refiners' cartel, while Vacuum also started tank-wagon deliveries and can delivery in twenty-five towns. In May, 1907, OLEX strengthened its position; it ceased to operate for refiners on a commission basis in foreign markets, and, organized as a separate export corporation to buy and sell products, pushed its sales more aggressively. In the following months, however, the rapid increase in production, which placed the nation a distant third in output to the United States and Russia, resulted in a drop in crude oil prices. In 1909 Vacuum almost concluded an agreement with the distressed producers to provide them with storage facilities.[54] According

Table 43 ESTIMATED AVERAGE DAILY CAPACITY OF REFINERIES LOCATED IN FOREIGN COUNTRIES AND OWNED BY AFFILIATES OF STANDARD OIL COMPANY (NEW JERSEY), 1906 AND 1911[a]

In barrels of 42 gallons

Company	*Plant*	*Location*	*Average Daily Capacity* 1906	1911
Europe				
Petroleum Raffinerie vorm. August Korff	Korff	Bremen, Germany	300[b]	[c]
Bedford Petroleum Company, S.A.F.	Rouen	Rouen, France	[c]	274
Romano-Americana	Bucharest	Bucharest, Romania	1,463	4,505
Vacuum Oil Company Reszvenytarsasag	Almas Fuzito	Hungary	621	1,425
Vacuum Oil Company Aktiengesellschaft	Dzieditz	Austria	770	2,494
Vacuum Oil Company Aktiengesellschaft	Schulau	Hamburg, Germany	500	594
Western Hemisphere				
Imperial Oil Company, Ltd., The	Sarnia	Sarnia, Ontario, Canada	2,395	3,997
West India Oil Refining Company, The	Havana	Havana, Cuba	300[b]	2,899
Waters-Pierce Oil Company	Mexico City	Mexico City, Mex.	100[b]	[c]
	Tampico	Tampico, Mex.	450[b]	[c]
	Vera Cruz	Vera Cruz, Mex.	250[b]	[c]
Asia				
International Oil Company, Ltd.	Naoetsu	Naoetsu, Japan	702	[d]
Total			7,851	16,188

[a] The naphtha rerun plants in Germany are not included.
[b] Estimated.
[c] No specific data available. According to unverified report, the plant of Waters-Pierce in Mexico City had been closed prior to 1911, the one at Vera Cruz limited in operations, and the one at Tampico expanded to a capacity of 5,000 barrels daily.
[d] Sold prior to 1911.
Source: SONJ, collection of predissolution data; Export Trade Recs., *passim*. The data for 1906 pictured the situation at the end of the year, while no exact date was given for the 1911 figures.

to one observer, the attempt broke down because of the appeal of other refiners to the government to prevent it. The Austrian press was critical.[55] Whatever the cause, the imperial government intervened; it took action to relieve the crude oil producers by itself providing facilities for storage and transport and by encouraging the use of fuel oil. At the same time it turned its fire on both Vacuum and Limanowa.

Starting in June, 1910, the Austrian government soon imposed unbear-

able pressure upon Vienna Vacuum. As owner of the railroads and telephone system, as well as the operator of the customhouse, the attacker possessed powerful weapons. The railroad refused to give Vacuum the special rate enjoyed by all refiners on crude oil from Boryslaw to Dzieditz. It canceled its contract to run tank cars for Vacuum, forbade to the company the use of the filling racks at Boryslaw, stopped service on the switch from the refinery to Dzieditz station, and finally closed the station to the company. Less overt but even more irritating, the customhouse, through which the excise tax was collected and all shipments had to be cleared, entered on a slowdown in handling Vacuum Oil's shipments. Restrictive regulations were rigidly enforced on the company's tank wagons. Under that barrage the firm succumbed and the Dzieditz plant closed. Fortunately, the refusal of the Hungarian government to follow Austria's example left the smaller plant at Almas Fuzito in operation.[56]

Diplomatic representations from the United States accomplished nothing for Vacuum, at the time, in marked contrast to the successful efforts of the Quai d'Orsay for Limanowa. The American Ambassador, R. C. Kerens, conferred with the Austrian government on the interpretation of the commercial treaties between the two nations, and a routine exchange of correspondence and opinions followed. Austria insisted that it had the right to control Vacuum Oil Company Aktiengesellschaft, a domestic company, just as the United States acted to protect the public from the excesses of the Standard Oil Trust, although from the evidence presented Vacuum was but a small operator in Austria, staying out of a cartel and suffering from discrimination by the railroads. In the meantime, the French government followed its protest on behalf of its nationals' investment in the Limanowa Company with a retaliatory tariff on Galician oil, which brought immediate relief. Before the year's end, Limanowa again received all the rates and privileges enjoyed by other refiners in Austria-Hungary.[57] Vacuum was still faced with solving its problem when it was separated from Jersey Standard in 1911.

INTEGRATED OPERATIONS IN ROMANIA

Fortunately, setbacks in Austria were offset by a measure of success for Standard Oil in adjacent Romania. There, after several years of preliminary efforts, the American combination had inaugurated its first fully integrated business in a European country.

The Romanian industry, as old as that of Galicia, also attracted renewed interest in the 1890's. A report to the British Foreign Office in 1897

characterized the petroleum business as lacking leadership, capital, specialists, modern methods, and adequate transportation. Other aspects of the situation gave promise, however. The quality of the crude was deemed good, and the domestic market was protected by a tariff. More important, the port of Constanza afforded a harbor for tankers and the Danube River provided cheap transportation to southern Germany. The ownership of land, held largely by the government and big landlords, and uncertainty over rights to petroleum land, had hindered earlier development, but a new mining law, effective in 1895 and revised in 1904, provided a separation of subsurface rights and offered protection to foreign holders of concessions.[58]

In company with many other outsiders, managers of Standard Oil quickly reacted to the improved legislative climate and economic outlook. In 1897 they dispatched experts to study the field. The preliminary trip was followed by several other expeditions in search of concessions. S. C. T. Dodd, C. F. Lufkin, and F. Q. Barstow all traveled to Romania in an effort to obtain a concession for Standard Oil there.[59]

After seven long years of investigations and frustrating negotiations amid several political changes, Standard Oil men finally succeeded in establishing an affiliate in Romania. Partly as a consequence of internal politics, the American company failed to obtain a satisfactory concession on public land. At one time Standard Oil officials seriously considered buying Steaua-Romána, an integrated firm reported to be holding the richest producing territory in the country. In the meantime they watched other companies in Romania grow stronger by the import of foreign capital. The Deutsche Bank, as a result of its investments in a Hungarian financial institution, took over Steaua-Romána. The increased exports from Romania, though not large, were coming into sharp competition with marketers of Standard Oil's kerosene in several countries.[60] At long last, in 1904, encouraged by changes in the mining laws and their acquisition of leases on private lands, C. F. Lufkin, J. E. Eggleston, and W. M. Page organized at Bucharest for Standard Oil the Románo-Americana Societate Anonimă pentru Industria, Comerciul şi Exportul Petrolului (hereinafter called Románo-Americana), with a capital of 12,500,000 lei (about $250,000).[61]

The employees of Románo-Americana comprised a motley and changing group of men of varied experience who served alongside those who were just entering the industry or assuming their first important responsibilities in it. H. P. Chamberlain and W. M. Page were selected as the

managing directors of the company after its start, although the former continued to serve as general manager of the refineries at Buffalo and Sarnia. Page resigned early and was followed by Nelson K. Moody. He in turn was succeeded as head of the Production Department, late in 1909, by E. J. Sadler, an Annapolis graduate, who, after three years in an unimportant position with The Prairie Oil & Gas Company, went abroad at a fourfold increase in salary. The drillers and superintendents were a hardy group of pioneers. They went to Bustenari, Comanesti, Tescani, Moreni, and other locations in the southern Carpathians on three-year contracts starting at $135 per month, many after experience in several American fields and some with additional seasoning in the producing service of Standard Oil at Hokkaido, Japan. Eggleston, superintendent of the Bayonne Refinery, was responsible for the building of a refinery known as the Teleajen Works, and W. C. Brower, from the Atlas Works, took over the superintendency. H. P. Rickard came from experience in Texas to be superintendent of pipelines. Salesmen versed in the American bulk distribution system, including one from St. Louis, added other skills. In addition a large number of Romanian employees entered the service of Standard Oil.[62]

As soon as the new affiliate was chartered, its managers, aided by funds and advice from the home office, swung rapidly into action to operate an integrated company. Complete sets of cable drilling tools, assembled earlier, accompanied experienced drillers from America. Româno-Americana acquired additional leases on private land at 8 or 10 per cent royalty on the crude oil and bought some equipment and operating wells from the European Petroleum Company and others. Rickard applied American speed to pipeline construction. Eggleston had the first four stills of the refinery near Ploesti in operation by late 1905. Its capacity per day was increased from 1,400 barrels for the following year to 4,500 by 1911. Hence, although small, it was Standard Oil's largest foreign refinery and somewhat bigger than either the Atlas or Cleveland works at that time.[63] Though the American affiliate at first stayed aloof from the Romanian marketing cartel, its managers were careful to explain their reasons in the press and to reply to criticism which had been publicly voiced by Prime Minister Sturdza and others.[64] Experienced American salesmen acquired leases or purchased marketing stations, signed contracts to employ their Romanian managers on a salary basis, and sold directly to country dealers. By 1908 the company boasted thirty-two stations, equipped with the most modern storing, measuring, and dispensing equipment from

the DAPG, and was delivering its brand Trandafir Alb (White Rose) from tank wagons.[65]

Operating in a foreign country which had had few earlier economic contacts with the United States, and where not only the laws but the geological and social conditions were very different from their own, the Americans in Romania had much to learn. S. C. T. Dodd appealed to the State Department for more satisfactory representation for Americans in a country where there was no adequate consular service and which shared an envoy extraordinary with two other countries.[66] Pennsylvania drilling methods were not directly suited to the Romanian formations of gravel and sand. Before successful production could be achieved, a period of experimentation was necessary, followed by several modifications in methods of drilling and lifting, such as the resort to underreaming, finishing wells with large-sized casing, and adding a calf wheel to move it frequently. Bailing was necessary to lift oil from some wells. Production was an expensive experience, with few satisfactory results before 1907. Even three years later, Sadler, getting his first foreign experience, was explaining to New York the necessity of unusual expenditures. Managers gave generous aid to a church to obtain the local support of the priest and his parishioners and made special outlays for celebrations on July Fourth to bring together the thirty-five scattered drillers and other Americans for the annual baseball game.[67]

Compliance with Romanian law required even more adjustment. While Romania helped the petroleum industry, it also regulated operators to a greater extent than did the United States. Like other petroleum companies, Româno-Americana enjoyed the governmental aids, such as provision of storage facilities, an improved harbor at Constanza, and the right to import some machinery and part of its sulphuric acid free of tariffs. On the other hand, it had to conform to many new requirements. Before drilling a new well, producers had to give much information on a five-lei sheet of stamped paper. At least 75 per cent of a company's employees, and half of those in administrative ranks above that of foreman, had to be Romanians.[68]

Româno-Americana's successful marketing aroused opposition from competitors and resulted in a law of 1908 to keep a larger share of the domestic market for other refiners. Quotas in the home market were set to some extent in proportion to a refiner's capacity, but with special weighting in favor of smaller refiners. Under a new law of 1910 the latter received relatively larger shares of the market. The price of kerosene was

set in relation to that of crude oil.[69] As a result of this legislation, Romậno-Americana, in June, 1908, became a shareholder in, and sold its marketing stations to, Societate Anonimă Romậna pentru Distribuirea Produselor Petrolului (known as Distribuirea or Distributia), a sales agency which marketed in Romania for the large refiners on a commission basis.[70]

In the face of these problems, successful operations in Romania were achieved but slowly, yet this experience in producing and refining abroad was significant and cannot be measured in output of products and profits alone. In 1909 Romậno-Americana was the third largest producer of crude oil with its output of 132,757 tons. Although its early success in marketing in Romania had been restricted by legislation, the Ploesti Refinery provided an increasing exportable volume of relatively cheap kerosene from an advantageous location for the German, Indian, and other markets, not to mention fuel oil for naval contracts. Quantities available for sale were smaller than had been anticipated earlier, but managers had laid the foundation of a growing business.[71] From the standpoint of the Romanian industry, Standard Oil had played a part in the development of the nation's economy by introducing new American methods and by stimulating through its confidence and successful operation the competitive entry of other companies, including Royal Dutch. This attraction of other companies to the area, which Lufkin and others fully anticipated,[72] was a common result of Standard Oil's entry into a field. More important for itself, through its affiliate Standard Oil gained experience in a foreign field; lessons learned in the skill of operating in Romania were to be used by Sadler and others in many foreign lands.

Not to be ignored was the advantage of knowing general conditions and costs of competitors' supplies. The last-named factor cannot be measured, but not without wider significance was Standard Oil's participation at this European crossroads of the petroleum industry, where not only Romanian businessmen but the Rothschilds, Les Fils de A. Deutsch, the Deutsche Bank, and Royal Dutch were active in one function of the industry or another. Standard Oil's position as a European producer also undoubtedly strengthened its hand as a negotiator of marketing understandings with competitors.

No reasons have been found for the difference in the response of Romậno-Americana to the Romanian Act of 1908 and that of Vacuum Oil Company A. G., Vienna, to the discrimination of 1910. Much must have depended on the difference in approach of the governments concerned. Romania passed a general law requiring marketers to share the

domestic trade according to a defined quota system; the Austrian government introduced a subtle, discriminatory, and most damaging campaign. Another set of relationships must have had some bearing on the outcome in the two countries. Through the Deutsche Bank's half-interest in Steaua-Română and participation in the European Petroleum Union, which from 1907 had had marketing agreements with various affiliates of Standard Oil in Europe, there was a friendly compromise between other Romanian companies and Româno-Americana in foreign trade. No such truce existed between OLEX and Standard Oil; in fact, after the strengthening of OLEX in 1907, the war between them, waged in part in the can business of Germany, was fought with no holds barred.

Many questions of general interest emerge from Standard Oil's early experience as a producer, refiner, and marketer of petroleum products in the European market, and these are more important than the relatively small volume of petroleum involved. Was the Romanian government reasonable in protecting the small refineries in their domestic market by persuading Româno-Americana to enter into a marketing cartel, or was it protecting a less economical method of manufacturing and distribution at the cost of the consumer? Was Standard Oil, by reducing prices in Romania and Austria, doing it for the purpose of attacking and weakening competitors in their home markets, while it strengthened its own position, or was it attempting to increase the volume of business in countries where prices had been high and consumption low in order to justify the economies of bulk distribution? Was Standard Oil applying in Europe the American principle that it is better to have a large market with a smaller margin of profit than a high profit per unit on a smaller volume?

There can be little doubt, however, that the American businessman in general, and Standard Oil in particular, must have been somewhat confused by the question of whether or not to work with others. In the United States in these years the many leaders in the petroleum industry who had decided to combine found their organization under fire for conspiring to organize the markets, while in Romania they changed their policy to conform to cartelization and in Austria their current operations were stopped because of unwillingness to enter a cartel.

In spite of many efforts, which were most strenuous during the early years of the century when fear was felt over future American supplies, Standard Oil did not accomplish more than a beginning in establishing producing and refining facilities in the vicinity of major foreign markets.

Affiliates of the American combination accounted for but .1 per cent of the crude oil production outside the United States by 1905 and for no more than .8 per cent at its predissolution high point in 1910.[73] Archbold and his associates had dispatched experts to examine properties in many corners of the world and had met with some success in two. By 1907 they had withdrawn in discouragement from Japan, but, after many initial difficulties, they had achieved a measure of success in Romania. In other countries they were unable to get established as producers. In some, refining rather than production seemed the best method of entrance into a foreign country. Even in refining, however, Jersey Standard and its affiliates played a minor role abroad, although their activities helped to strengthen their position in some markets. In general the new fields in America were more attractive than those abroad during the latter half of the decade. Furthermore, after 1903 groups of producers in the United States, aroused by the falling price of crude, might have been more critical of Standard Oil had it pushed foreign production and used less of the domestic output which was clamoring for a market.

Chapter 18

Relations between Jersey Standard and Its Foreign Affiliates

At the same time that Jersey Standard, through affiliates, was enlarging its participation in foreign producing and refining, its managers gave increasing attention to marketing abroad. Prior to 1899 Standard Oil men had laid an important foundation for this function. In the following decade new agencies were established, new affiliates were organized, and stronger ties were forged between old and new affiliates and the parent company.

RELIANCE ON AMERICAN SUPPLIES

By far the greatest volume of Standard Oil's exports were sold to its own affiliates or by its own agents during the first decade of the twentieth century, in marked contrast to the sales through brokers and commission agents in the 1880's. Statistics are lacking as to the percentages of the affiliates' purchases furnished by foreign production of the combination and by firms not associated with it, but the total was not a large part of the supplies. Jersey Standard and its affiliates not only became stockholders in an increasing number of foreign companies but they also continued as the suppliers of petroleum products which were carried largely in ships of affiliated corporations.

In 1901, to facilitate doing business in areas where Standard Oil Company (New Jersey) had no existing affiliates, its officers organized the wholly owned Colonial Oil Company with a capital of $250,000. As already mentioned, the corporation failed to establish itself as a producer in Burma, in spite of the broad powers of its charter. Colonial Oil's very establishment, however, signalized Standard Oil's intention to market through an affiliate in countries where it had previously had no such connection. By 1902 Colonial Oil was already selling in Portugal and Australia, and it soon carried on that function in South Africa, South America,

and a number of countries elsewhere. Many of its employees and much of its business, however, had been transferred to Vacuum Oil Company by 1908.[1]

Vacuum Oil Company had established agencies and affiliates in a number of countries to forward its business in lubricants, as mentioned in Chapter 16; some of these companies took on wider duties. Their works turned out some kerosene and other petroleum products in addition to lubricants. In several countries where Jersey Standard had no direct affiliate other than Colonial Oil, a branch or affiliate of Vacuum Oil Company undertook to market the shipments of American kerosene. Perhaps this step was taken to avoid the double overhead of running both branches of Colonial Oil and offices of Vacuum Oil companies. The latter also had established valuable connections with buyers of lubricants. In 1910 Vacuum Oil's foreign units marketed more than a million barrels of kerosene from the refineries of New York Standard, Jersey Standard, and Atlantic Refining, in Australia, New Zealand, Portugal, Egypt, and South Africa.[2]

The list given in Table 44 indicates the number of affiliates of Jersey Standard which operated abroad. The four marketing companies on the European continent—American Petroleum, Det Danske, Deutsch-Amerikanische Petroleum-Gesellschaft, and Italo-Americana—had acquired additional affiliates of their own by 1911. Anglo-American had merged with itself the affiliated English shipping companies. In 1902 the partnership of Bedford et Compagnie had been liquidated and thereafter Bedford Petroleum Company carried on operations for Standard Oil in France. It and the new companies for South American trade operated in areas where Standard Oil's policy differed from that in other countries.

Three exceptions existed to the general rule that by the end of the decade most exports of Standard Oil's products went abroad either to one of its affiliates or to its agencies. Sales by Standard Oil to the French and Spanish Refiners continued to be special cases, as did the majority of the exports to Latin America.

Standard Oil sold for export to the French and Spanish Refiners under long-term contracts, crude oil making up a large percentage of the deliveries. In 1893 a six-year contract between Standard Oil and the French Refiners had covered exports of crude oil, kerosene, and naphtha. Because of the differential tariff between crude and refined products, raw material constituted most of the purchases. A similar contract had been signed with the Spanish Refiners, and there were but few changes in

Table 44 AFFILIATES OF STANDARD OIL COMPANY (NEW JERSEY) ENGAGED IN FOREIGN TRADE, WITH THEIR SUBSIDIARIES AND CHIEF MARKETS, 1911

Europe

- Aktien Gesellschaft Atlantic, Italy
- Anglo-American Oil Company, Ltd., United Kingdom
- American Petroleum Company, Holland, Belgium, and western Germany
  - Amerikanische Petroleum Anlagen GmbH
  - Compagnie Industrielle "Atlas," S. A., Hoboken
  - Compagnie Pétrolifère, S. A., à Gand
  - Eschweiler Petroleum Import
  - Ghent Petroleum Company
  - Hollandsche Petroleum Vereniging, Amsterdam
  - Maatschappij Pétrolifère, Rotterdam
  - Maatschappij tot Detailverkoop van Petroleum "De Automaat"
  - Mannheim-Bremer Petroleum-Aktiengesellschaft[a]
  - Petroleum Raffinerie vorm. August Korff[a]
  - Pétrolifère Nationale, S. A., à Gand
  - Rheinische Petroleum Aktiengesellschaft
  - Société Anonyme pour la Vente des Pétroles, ci-devant H. Rieth et Cie
  - Strassen-Tankwagen Gesellschaft (Street Tank Wagon Business), Düren
  - Sudan Frères et Cie
- Bedford Petroleum Company, Société Anonyme Française, France
- Det Danske Petroleums-Aktieselskab, Scandinavia
  - Aktieselskabet Ostlandske Petroleumscompagni, Christiania
  - Aktieselskabet Vestlandske Petroleumscompagni, Bergen
  - Krooks Petroleum & Oljeaktiebolag, Stockholm
  - Nordisk Benzin Compagni
  - Skandinavisk-Amerikansk Petroleums-Aktieselskabet
  - Skanska Petroleums Aktiebolaget, Helsingborg
  - Sydsvenska Petroleums Aktiebolaget, Malmö
  - Vestkustens Petroleum Aktiebolag, Gothenburg
- Deutsch-Amerikanische Petroleum-Gesellschaft, Germany and Switzerland
  - Hamburger Luftschiffhallen GmbH
  - Königsberger Handels-Compagnie
  - Mannheim-Bremer Petroleum-Aktiengesellschaft[a]
  - Petroleum Import Compagnie, Switzerland[b]
  - Petroleum Raffinerie vorm. August Korff[a]
  - Schweizerische Petroleum-Handels-Gesellschaft[b]
  - Société Anonyme Petrolea[a]
  - Wachs & Flössner Petroleum GmbH
  - Westfalische Petroleum GmbH
- Gibraltar Petroleum Company, Ltd.
- Raffinerie Française
- "Româno-Americana" Societate Anonimă pentru Industria, Comerciul şi Exportul Petrolului, Romania

Table 44 (Continued)

Societate Anonimă Romàna pentru Distribuirea Produselor Petrolului
Società Italo-Americana pel Petrolio, Italy, Switzerland, parts of North Africa
Petroleum Import Compagnie[b]
St. Paul Petroleum Tanks, Ltd.
Schweizerische Petroleum-Handels-Gesellschaft[b]
Società Anonima La Mediterranea, Rome
Società per gli Olii Minerali
Société Anonyme Petrolea[b]
Società Meridionale pel Commercio pel Petrolio, Naples
Société Tunisienne des Pétroles
Tank Storage & Carriage Company, The
Vacuum Oil Company, New York[c]
Vacuum Oil Company Aktiengesellschaft, Germany
Vacuum Oil Company Reszvenytarsasag, Hungary
Vacuum Oil Aktiengesellschaft, Austria
Vacuum Oil Company, Société Anonyme Française, France
Vacuum Oil Company, Aktiebolag, Sweden
Vacuum Oil Company, Ltd., England
Vacuum Oil Company, Società Anonima Italiana, Italy
Vacuum Oil Company, Proprietary, Ltd., Australia
Russian Vacuum Oil Company, Ltd., Russia
Vacuum Oil Company, Union of South Africa
Other Areas
Colonial Oil Company, miscellaneous markets
Imperial Oil Company, Ltd., The, Canada
Queen City Oil Company, Ltd., The
Standard Oil Company of Brazil
Standard Oil Company of New York, Far East
Waters-Pierce Oil Company, Mexico
West Coast Oil Fuel Company, Ltd., west coast of South America
West India Oil Company, Caribbean and South America
West India Oil Refining Company, The, West Indies

[a] These companies were jointly owned by DAPG and American Petroleum Co.
[b] These companies were jointly owned by DAPG and Italo-Americana.
[c] Vacuum Oil Co. had branches all over the world. The affiliates are given in the order of incorporation between 1899 and 1908.
Source: SONJ, Consol. Accts. of SONJ, 1911.

it after 1900; the exports to Spain increased only slightly, averaging about 280,000 barrels of crude oil per annum for the years 1909 to 1911.[3]

Between Standard Oil and the fourteen French Refiners several new contracts and frequent modifications of the terms in practice became necessary. The patience and finesse that characterized negotiations in 1893 also marked these later ones.[4]

Numerous factors encouraged the French to ask for modifications of

their agreement with Standard Oil and for the latter to make concessions. The ten-year contract of 1900 stipulated that the French would buy 80 per cent of their petroleum from Standard Oil. At that time the Americans safeguarded themselves against a possible shortage of supplies by arranging for prorating deliveries in that eventuality. The scarcity of 1902 and 1903 made them willing to agree to the French demands.[5] A new French tax on manufactured petroleum products, 1.25 francs per 100 kilograms in 1903, cut the profit margin of the refiners. At the same time members of the Chamber of Deputies began agitation for a government monopoly of petroleum, which remained a "vital possibility of the future."[6] The French Refiners were also meeting with sharp competition from Romanians and Galicians, the latter served by especially "intelligent and pushing" agents.[7] The Pure Oil Company, Limited, was reported back of a lively new French refining organization, Société Industrielle. Harassed by increasing competition as well as the new tax, the French Refiners asked in 1903 that the current agreement be modified—first, to enable them to purchase a larger percentage of their supplies from cheaper European sources, and, secondly, to allow for an increase in the proportion of their contracted minimum to be filled by kerosene rather than crude oil.

The French Refiners gradually bought more of their supplies from other sources. At one time members of the syndicate hesitated to refuse to purchase additional crude from Russia for fear of more aggressive competition from that quarter. Meanwhile Rothschilds, Desmarais frères, and other French interests were investing in producing properties and refineries in Romania or Galicia, or both. From 1906 onward, Texas oil also became a factor in the French market. All these facts changed the competitive picture even before the maximum French tariff was levied on American exports for some months in 1909-1910 and the minimum tariff was applied to petroleum from the Dutch Indies in the latter year.[8]

In consequence of the various modifications in the French situation, Standard Oil gave up its small role in the French refining industry. Under the contracts with the French Refiners, Bedford Petroleum Company, S. A. F., had the right to run for them a limited quantity of crude oil (160,000 barrels per year) at its own two plants. Its refinery at La Pallice became a bulk station in 1904, and the larger one at Rouen was closed in 1911.[9] Thus ended, for the time being, Standard Oil's activities as a refiner in France, begun in 1893.

As a result of these and other changes Standard Oil occupied a less

important place in the French market at the end of the decade than at the beginning. Imports from Russia and Romania had increased and together considerably exceeded the total from the United States, which was not all from Standard Oil. Galician imports were also growing. The contract covering sales by Standard Oil to the French Refiners in 1910 was merely a supply contract which set a minimum and maximum gallonage rather than a share of the market. For 1910 kerosene made up about 58 per cent of the total of some 1,300,000 barrels purchased by the French Refiners from Standard Oil (the contract covered only crude, kerosene, and naphtha) and crude oil constituted 32 per cent, compared with its major position earlier in the century. The American combination was making refining profits on much of its exports to France in 1910, but its shipments to that country showed an absolute and relative decline. If it still enjoyed about 70 per cent of the market in 1906, its share was probably about a third by the end of the decade.[10]

Although sales to Central and South America remained to some extent exceptions to the general rule of more direct marketing by Standard Oil, some important pioneering steps were made in this decade.[11] Waters-Pierce activities in Mexico are discussed in another connection. The West India Oil Refining Company continued to export from the United States a small quantity of crude petroleum, refine it at Belot, near Havana, and market it in Cuba. After the Spanish-American War, when kerosene was put on the free list for Puerto Rico, the company closed its refinery there.[12] Standard Oil achieved increased participation in the trade to the south in 1902 by forming a marketing corporation, the West India Oil Company, with a capital of $100,000 under a New Jersey charter. The young managers used initiative in establishing a few new stations in the West Indies, starting with Puerto Rico.[13] There they received kerosene in barrels and delivered some of it in tank wagons. They imported posts and lamps for lighting villages, sold cheap lamps, and selected suitable brand marks, Christopher Columbus and a fighting cock, for example. Only in a few places, however, did West India Oil Company have its own salaried employees or commission agents.

Most Standard Oil kerosene for South America was sold f.o.b. New York or Baltimore and arrived in cases and cans to the account of commission merchants. Busy with marketing many commodities and interested in a large markup, they did not develop a mass market, and the volume of sales increased slowly. As recounted earlier, through Empreza Industrial de Petroleo, Standard Oil had made an abortive attempt to be-

Table 45 EXPORT DELIVERY OF CRUDE OIL AND LEADING PETROLEUM PRODUCTS BY STANDARD OIL COMPANY (NEW JERSEY) AND ITS AFFILIATES FROM THE UNITED STATES, 1910[a]

In barrels of 42 gallons

Delivered to	*Crude Oil*	*Kerosene*	*Naphtha*	*Gas Oil*	*Fuel Oil*
Standard Oil Affiliates and Agents					
European Affiliates					
American Petroleum Co.		1,546,931	92,992	115,915	
Anglo-American		2,268,869	548,124	961,557	197,067
DAPG		3,477,531	450,745	13,861	
Det Danske	20	1,302,721	18,381		
Italo-Americana		817,863	114,229		
Standard Oil Co. of New York, Agents					
Batavia		477,904	2,412		
Bombay		696,102	3,356	7,150	
Calcutta		472,007	1,173		
Hong Kong		969,215	15,208		
Japan		1,002,079	5,205		
Shanghai		1,910,248	2,119		
Turkey		21,333			
Vacuum Oil Co. Affiliates and Agents					
Australia and New Zealand	83	526,027	119,382	1,456	2
Egypt		138,225	2,305		
Portugal		143,955	14,115		357
South Africa		312,100	27,255	338	426
Standard Oil Affiliates, Central and South America					
Waters-Pierce Oil Co.	172,055	1,149			
West India Oil Co.[b]		64,786	15,793		225
West India Oil Refg. Co., The	123,379				
Subtotal	295,537	16,149,045	1,432,794	1,100,277	198,077
Outside Organizations					
Commission Merchants	26,027	1,641,208[c]	210,779[c]	2,983	233,911
French Refiners	427,812	768,147	129,585		
Spanish Refiners	219,698				
Subtotal	673,537	2,409,355	340,364	2,983	233,911
Grand Total	969,074	18,558,400	1,773,158	1,103,260	431,988

Table 45 (Continued)

[a] These figures include oil purchased by Standard Oil units from Tide Water Oil Co.
[b] These figures do not include River Plate markets.
[c] These figures include shipments to River Plate and Brazil.

	Kerosene	Naphtha
River Plate	433,667	168,160
Brazil	706,312	33,489
Total	1,139,979	201,649

Source: SONJ, old export statistics, F. D. Ascho, Oct. 28, 1911.

come a refiner in Brazil, the biggest South American market, but in this decade most sales continued to be made through commission merchants. The organization of the Standard Oil Company of Brazil in 1910[14] and the purchase in 1912 of the Campana Refinery in Argentina signalized the beginning of changes.

In 1911 Jersey Standard acquired a 70 per cent interest in the new West Coast Oil Fuel Company, Limited, chartered in Great Britain. Its managers started building bulk stations and making contracts to deliver fuel oil from Peru and California to nitrate, shipping, and railroad companies on the west coast of South America, and sent some of Peru's lighter oil north to the United States to make gasoline.[15]

John Worthington's earlier report on Peru, however, was typical of those of Standard Oil men on South America at the time: "*It will be more profitable to buy production than to hunt for it*, and to buy oil than to run the risks in this territory for producing it."[16] Standard Oil did not enter Central or South American production except for the small participation of Waters-Pierce in Mexican operations.

In spite of the growing importance of other products, kerosene remained the chief petroleum export and illustrates Standard Oil's policy as to marketing outlets. Statistics in Table 45 show the marked contrast from an earlier period. In 1882, apart from the New York Standard's small investment in Meissner, Ackermann & Company and the few exports by Thompson & Bedford Company, Limited, to its agencies, outside commission agents or brokers handled the marketing of all Standard Oil products for foreign trade. In 1910 only 13 per cent of the combination's exports of kerosene was sold through outside commission agents and to the French Refiners. The other 87 per cent went to Standard Oil's foreign affiliates and its own agencies abroad. About 50 per cent went to Jersey Standard's five European affiliates—DAPG, Anglo-American, American Petroleum, Det Danske, and Italo-Americana—while almost 30 per cent went to the agencies of New York Standard in the Far East, another 6 per cent to Vacuum Oil's affiliates, and the small remainder to the various other companies named in Table 45.[17]

A similar division existed for most other leading products. About two-thirds of Standard Oil's 1,773,158 barrels of 42 gallons of exported gasoline and naphtha in 1910 went to European affiliates. The total had been more than trebled since 1906, but Standard Oil bought additional supplies in other continents to satisfy its foreign markets.[18] Anglo-American was by far the largest foreign buyer of the combination's exported gas oil. Fuel oil sold for export by Standard Oil was about equally divided between commission merchants and affiliates, chiefly Anglo-American, while outsiders accounted for a larger percentage of the exports of crude oil purchased from the combination.

Table 46 SOURCES OF EXPORT DELIVERIES OF KEROSENE BY STANDARD OIL COMPANY (NEW JERSEY) AND ITS AFFILIATES, 1910, CLASSIFIED BY REFINING COMPANY[a]

In barrels of 42 gallons

Refining Company	*Kerosene*	*Per Cent*
Standard Oil Companies		
Atlantic Refining Company, The	4,670,064	25.2
Standard Oil Company (California)	756,552	4.1
Standard Oil Company of Louisiana	15,374	0.1
Standard Oil Company (New Jersey)	7,909,030	42.6
Standard Oil Company of New York	2,998,040	16.1
Tide Water Oil Company	2,209,340	11.9
Total	18,558,400	100.0

[a] This table refers to the company which processed the oil, not to the exporter. Standard Oil Co. (New Jersey) as an operating company, as well as most other units in the combination and the allied Tide Water, sold for export to Standard Oil Co. of New York.
Source: SONJ, old export statistics, F. D. Asche, Oct. 28, 1911; *U.S. v. SONJ*, Testimony, I, 93, and II, 862.

The pattern of supply from Standard Oil domestic refineries to all foreign markets continued much the same as earlier. The largest refiner for export trade was Jersey Standard itself. (See Table 46.) As an operating company it accounted in 1910 for 7,909,030 barrels out of 18,558,400 barrels of kerosene exported. Some 4,000,000 of these went to the European affiliates, another 2,000,000 to the Far East, and some of the rest to supply Vacuum Oil's companies. The second largest refiner for export—The Atlantic Refining Company—had one distinction which its parent lacked. While Jersey Standard sold through the Standard Oil Company of New York, and even by 1910 billed only about 100,000 barrels of kerosene directly, The Atlantic Refining Company throughout the

period sold some of its products directly for export, and by 1910 billed all its kerosene in its own name.[19]

Jersey Standard led the field not only as a refiner of kerosene for export, but in the export of other leading products as well. More than half of the gasoline and naphtha exported by the combination from the United States came from Jersey Standard's own coastal refineries, and New York Standard almost equaled it in the quantity of gas oil prepared for export in the New York Harbor refineries.

New York Standard maintained its pre-eminence as a seller of exported American petroleum products. It not only carried out this work for its own products and those of others in the combination, but also acted for petroleum companies outside Standard Oil. In 1903 a group of sixteen refineries, all in Pennsylvania except one in Marietta, Ohio, contracted to deliver for export 427 barrels of kerosene per day in return for sales of crude petroleum to them. The agreement, based on mutual interest, lasted about three years; the refineries needed the raw materials and Standard Oil wanted the products. Through an arrangement dating from the 1880's, Standard Oil continued to market the exported kerosene of the allied Tide Water Oil Company.[20]

To transport more efficiently and profitably the increasing volume of these exports, affiliates of Jersey Standard together built up the largest ocean-going oil-carrying fleet in the world belonging to one combination. Its cargo steamers, tank steamers, and sailing vessels traveled under many flags.[21]

By far the largest number of vessels in the Standard Oil fleet flew the British banner. In 1909 Anglo-American led the parade with forty-seven ships of all types, which included twenty-eight tankers and nineteen general cargo ships, of which fifteen traveled under sail. For years Anglo-American's *Narragansett*, built in 1903, with machinery and boilers amidships and a capacity of 3,780,000 American gallons, ranked as the world's biggest tanker. When six years old it was converted from the use of coal to fuel oil, joining its younger sister, the *Iroquois,* in that respect. The latter, built in Belfast during a year of high prices for coal and rates for charters, was designed to tow barges across the Atlantic.

Ships flying the German flag ranked next in number. None of them belonged to the general cargo category. DAPG's twenty-one vessels included a few of the pioneering tankers and several new, large, oil-burning, steam tankers. Two of these, with names as American as *Buffalo* and *Niagara,* were fitted to tow barges. A few specialized in carrying

lubricants in bulk, while others concentrated upon trips to bring naphtha from Sumatra. Aktien Gesellschaft Atlantic operated two tankers supplying Italo-Americana. Although the idea of transferring vessels to some flag more likely to be neutral than the German was considered at least as early as 1905, no action was taken at that time or in the years to 1911.

Fleets of other companies were smaller. The American Petroleum Company owned the third largest number of vessels among the companies in the Jersey Standard family. Antwerp was the home port of four and Rotterdam of six. Det Danske had but one tanker for use in the Baltic and North seas, but the company had the distinction of having made the purchase in spite of the disapproval of its largest stockholder, Jersey Standard. Both California Standard and New York Standard operated a few vessels venturing beyond coastal trade. The former's fleet, mentioned in Chapter 12, burned oil as fuel, as did New York Standard's *Colonel A. F. Lucas*, which was one of two in the company's name used to tow heavy barges across the Atlantic. Beginning in 1903, the latter company started operating a fleet of ships on time charter from Anglo-American. They carried supplies to New York Standard's agents in the Far East.

Supplies for the important Eastern markets went out both in sailing ships and in steamers. Of the 5,500,000 barrels of illuminating oil exported for the lamps of the Orient in 1910, California Standard supplied about 13 per cent. All the remainder came from Eastern refineries, and Jersey Standard supplied two-fifths of this amount. Although sailing ships carried cases and cans from New York Harbor and Point Breeze to the Far East throughout the period, tankers carried some of the kerosene beginning in 1904. Since such a large proportion of the shipments came from the East Coast in 1910, some thought was given to the possibility of laying a pipeline from some point on the Gulf to a port on the Pacific and thereby shortening the journey some 5,500 miles from the long trip through the Suez Canal,[22] but no action was taken on this suggestion. Exports from California more than doubled the next year.

During the period that Jersey Standard headed the Standard Oil group there was, in fact, little change in the general supply pattern. A small quantity of products was refined abroad for Standard Oil's world market, in some cases from foreign crude, but most of the supplies came from the United States. New refineries in that country, such as those in California and Louisiana, contributed products, but the refineries of Jersey Standard itself as an operating company continued to be the chief source of supplies. Most of the products went abroad to be marketed by affiliates. In the

actual mechanics of sales for export New York Standard and Vacuum Oil played the leading roles.

STRENGTHENING THE TIES WITH EUROPEAN AFFILIATES

Early in the century the executives of Standard Oil decided, "*as far as practicable,* to follow much more closely and in a more practical manner" the operations of all the companies in the combination, including the foreign ones.[23] Standard Oil had heavy investments abroad, and it depended on foreign markets for sales of more than 60 per cent of its kerosene. Top managers concerned with "the general interest" wished to benefit by the exchange of information and of experience over a wider area, to improve marketing methods, and in general to operate each part of the integrated petroleum business with consideration for the whole.

To carry out their plans successfully the managers had to keep several things in mind. They had to recognize the legal position of the affiliates as separate corporations, to observe the interpretations of the laws of the different countries, and to watch the political atmosphere of each nation. Furthermore, top management of a holding company could implement its policies only by establishing sound association between its staff and men in the affiliated companies.

Several ties between Jersey Standard and its foreign affiliates held them together; these were of very different types—legal, economic, and personal. Contracts defined the relationships to a limited extent,[24] and customary practices grew up to strengthen the bonds between the organizations on both sides of the Atlantic. Since individuals were involved in running these legal entities, the way in which the links were formed and the units operated differed from one affiliate to another. In each case, however, the chief binding factors were supply of petroleum products by the parent company and Jersey Standard's dependence on the market of the affiliate. Stock ownership differed in percentage from one company to another and from time to time, but it was usually accompanied by American representation on a stockholders' committee or on a board of directors or by resident managing directors.

The problem of striking a balance between an appropriate degree of centralization and a necessary amount of autonomy in a large organization was complicated by the geographic spread of the operations. Standard Oil wanted spirited foreign managers capable of exercising initiative; the necessity of having able European allies, preferably of

national influence, to meet national conditions had made that policy imperative. The pride and sensitivity of some foreign managers would have dictated cautious handling of relationships even if legal requirements had not.

In the formative years of a closer association between Jersey Standard and its affiliates, Standard Oil men learned to exercise great care in conforming to the laws of the several countries in which they operated. Top managers were not fully aware of all the different questions at the beginning of the decade. Many active marketers must have been in sympathy with the idea expressed by Heinrich Riedemann: "You know that legal questions are somewhat doubtful, and no one can take an insurance policy upon the issue of any possible lawsuit, even if the facts are absolutely clear."[25]

A number of policies were changed over a period of time to meet the legal climate. On the advice of their lawyers, managers of Standard Oil took care in wording supply contracts to safeguard the affiliates' privilege of buying from outsiders. Negotiators of contracts avoided the inclusion of unqualified promises to purchase from Standard Oil.[26]

The rights of minority stockholders in affiliates remained an important consideration. William Donald had been critical of the managers of DAPG when that company's subsidiary, Korff, stayed in the Benzine Syndicate; he felt that the decision was based on Korff's "personal interest" rather than "the general interest." However, when negotiations with the Korff Refinery were under way in 1905, Donald remarked that in all relations with affiliates Standard Oil should take such action as could be "absolutely defended as best for the company in question." That the results lived up to this aim was indicated by Heinrich Riedemann's comment at a later date that the stockholders of Korff felt confident of Standard Oil's "liberal and fair spirit."[27]

Although managers were aware of the necessity of considering both the interests of minority stockholders and those of the country in which the affiliate operated, they became increasingly aware of possible interpretations of these responsibilities. In deciding intercompany financial relations—prices charged for products sold to affiliates and interest charged on loans and credited on balances—the managers not only had to safeguard the rights of the minority stockholders but also had to observe the tax regulations of the nation in which any function that gave rise to income was performed. The problem was one of maintaining fair prices to affiliates for products in order that manufacturing profits would

stay in the United States, which was free of income taxes, while marketing profits would be taxed in the appropriate country. On deposits from affiliates a rate of interest must be paid comparable to that available locally to the companies in order to avoid any appearance of shifting to America profits subject to foreign income taxes.[28] Moreover, the holding company did not wish to control operations of affiliates in such a way as to make itself liable for foreign taxes on its own income earned in the United States.[29] After 1907 Anglo-American made no sales of lubricants for New York Standard on a commission basis and established itself in the eyes of the British tax authorities as an independent company which carried on business on its own account.[30] While considering "the general interest," top managers must keep the affiliates separate so that their directors ran a business and did not act as agents. There was a greater awareness of need for caution after 1905, when court cases in several states of the United States, and the sensational airing of them in the press, made foreign governments more alert to any connections of companies with Standard Oil.

The changes in the relationship between Jersey Standard and its affiliates and their methods of working co-operatively will be illustrated here with special reference to Standard Oil and its five chief European affiliates—Anglo-American Oil Company, Limited, in the United Kingdom; American Petroleum Company in Holland, Belgium, and western Germany; Deutsch-Amerikanische Petroleum-Gesellschaft in Germany; Det Danske Petroleums-Aktieselskab in Denmark, Sweden, Norway, Greenland, Iceland, and the Faroe Islands; and Società Italo-Americana pel Petrolio in Italy, Sicily, Malta, and parts of North Africa.

During these years there was a marked shift in stock ownership. After the dissolution of the Standard Oil Trust in 1892, Anglo-American had held the shares in the European affiliates and worked with other Standard Oil companies in a community of interests. In 1899 Anglo itself became a direct affiliate of Jersey Standard. Starting in 1904 with shares of DAPG, within the next four years Anglo transferred all its holdings in the main European affiliates directly to Standard Oil Company (New Jersey).

More significant than the change in the holding company was the increase in the percentage of stock held in affiliates. Standard Oil's holdings in Det Danske rose from 30 to 51 per cent in 1901 and nine years later increased, with the enlargement in the capital of the Danish company, to 80 per cent. In 1904 Jersey Standard's holding in DAPG amounted to 90 per cent, as compared with the 38 per cent of the

Standard Oil Trust in the German company in 1890. In the same decade, holdings in Italo-Americana increased 8.7 per cent, which raised Standard Oil's share to over 60 per cent.[31] Only in American Petroleum did Jersey Standard's ownership remain just slightly over 50 per cent.

Stock ownership, however, constituted merely a legal tie. Where Standard Oil's share was not great, the Jersey Company could be expected to have little or no influence on the appointment of directors of affiliates. Even where it held somewhat more than 50 per cent, the voice from America was not always distinctly heard by those with other opinions.

During the period under review changes in management in some of the foreign companies brought them closer to Standard Oil. Anglo-American already had several Americans among its managing directors, and apart from replacing men, no significant change occurred. From its birth in 1888 it had adopted American marketing methods. When Benedicto Walter and Paul and Benno Wedekind retired as managing directors of Italo-Americana between 1902 and 1905, A. Becchi, W. Hormann, and August von Hartz became the leaders.[32] The last-named, having gained his experience in Meissner, Ackermann & Company and New York Standard, consulted amicably with the American director, Walter McGee, son of the earlier specialist in foreign marketing for Standard Oil.

Contrary to the ambitions of officials at 26 Broadway, management of the American Petroleum Company remained in the hands of Belgian and Dutch directors. When in 1903 ill health forced Frederic Speth and F. W. Randebrock into partial retirement, members of the Export Trade Committee thought it was a good time to elect some American directors, but even the astute James McDonald, managing director of Anglo-American, which at the time held most of the 51 per cent of the stock owned by Standard Oil interests, failed to accomplish this end. Albert Maquinay and Otto Randebrock continued to serve through this period. F. Horstmann, son of one of the founders and a man of "comprehensive ideas and general business ability," and W. T. Klaare, characterized by associates as the company's "ablest man," went on the board in 1903. Through Livingston Roe, Jr., Standard Oil wished "with great respect" the new directors every success.[33] Although Speth did not retire, Charles Good of Antwerp was later added to the board. This was an alert and progressive group of marketers, who were pleased to receive advice from New York and had no hesitancy in giving some in return.

Top management of DAPG was changed completely in 1904, after about three years of careful negotiation. Americans had served on the board of

governors but not on the active executive committee, which was composed of Wilhelm Riedemann and the two other German founders. T. C. Bushnell wrote to McDonald in 1901 that Standard Oil desired to have an American included in management and suggested that the young Riedemann sons be promoted to make the move palatable. "A visit for the purpose covered in the letter will be about as unwelcome as any I have ever made to Germany," McDonald replied. "It will take me at least a week to think up some way of broaching the subject, so that the elder Mr. Riedemann will not have an attack of heart failure on the spot." McDonald could not foretell the German government's attitude, but he suspected that it would be "something awful." "However," he added, "I will take out a little extra life insurance and make a trip."[34] Competition in Germany was very keen during the following years, DAPG needed more capital to meet it, the managers were aging, and the original contract with Standard Oil was drawing to a close. In 1904 the founders exchanged their stock for shares in Jersey Standard and retired.

A strong international team then took over management of DAPG. The Riedemann brothers (Heinrich and Dr. Tonio), William Donald, Howard Page, and Walter C. Teagle made up the executive committee. The conciliatory William Donald, when resident in Europe, smoothed relations with the Riedemanns and greatly influenced policy. Dr. Tonio Riedemann had already shown his ability in starting to reorganize distribution with the aid of F. E. Powell, a tank-wagon expert and director of Anglo-American. Heinrich Riedemann, characterized by McDonald as a man with a disposition to investigate everything thoroughly, and as possessing both a broad outlook and good judgment, was to be an important executive in the Jersey Standard group.[35] He and Teagle, both forceful men, early developed a respect for each other. While advice flowed from New York, very definite suggestions were made and opinions expressed by those in Germany, who had a keener awareness than the Americans of the many economic and political crosscurrents in the burgeoning German industrial life. The new younger managers, more venturesome in their youth than the founders had been in their old age, continued to sustain DAPG's position as the largest marketer of Standard Oil kerosene abroad and made a record of which even the elder Riedemann and the pioneering Schüttes would have been proud.

The management of Det Danske also passed into new hands as age took its toll of the pioneers who had founded the European affiliate, but the Danes continued to display the independence of King Canute. Christian

Neilson, who had followed the original manager, Waldemar Wulff, died in 1901 and was succeeded by Christian Holm, the son of a founder.[36] The new manager was young, vigorous, sensitive, and proud. Characterized as "intelligent," "eager," "antagonistic," "persistent," and as a "keen business man,"[37] he made the task of the new American director, Charles A. Sutfield, domiciled in Denmark by early 1902, a lively and not always comfortable one. At the beginning of the century the Danes showed interest neither in expanding their own investment in marketing nor in calling upon Standard Oil for funds to modernize their methods.[38] The gradual adoption of changes was in part due to the tact of Sutfield working with Holm and in part the result of the vigor of competitors.

The careful attention to personal feelings displayed by Standard Oil managers, as well as the care of their Legal Department in maintaining the spirit and the letter of the contracts between the American company and European affiliates, is illustrated by the relationship between Standard Oil, Det Danske, and the latter's affiliates in Norway and Sweden. A supply contract with Det Danske limited Standard Oil's direct participation in Scandinavian countries. In 1904, Teagle, himself a director of Det Danske, was not satisfied with the situation. He was eager to have the agreement so modified that Standard Oil might sell in Norway and Sweden, or purchase an interest in a refinery in Norway directly or indirectly through its affiliate, Vacuum. He asked Dodd whether, since the majority of the Danske directors opposed the move, appeal could be made to holders of its stock, of which Standard Oil Company (New Jersey) owned 51 per cent. Dodd replied: "The answer in my opinion is *No*. This would be contrary to the plainest dictates of justice. What it cannot do directly it cannot do in this indirect way. If the contract is altered it must be by a vote of the directors, or by a majority vote of *disinterested* stockholders."[39] His advice was heeded, although it delayed the tightening of the relations with the northern Scandinavian trade another six years—until the existing contract ran out in 1910.

Changes were then successfully accomplished through new contracts negotiated by Teagle and by a visit to Scandinavia by F. D. Asche. The new supply agreement was made in the name of New York Standard, both because the original one had been with that corporation and because Jersey Standard had no foreign sales department of its own. At the same time, another contract between Jersey Standard and Det Danske stipulated that the former's stockholdings in the latter should be increased as capital was added.[40] Det Danske increased its ownership in the affiliates

in Sweden and Norway. Holm and Asche personally went to make the arrangements with these northern companies in 1909. Holm's pleasure in the trip and his remarks on the Swedish directors' "admiration" for Asche's "noble and gentlemanlike way of negotiating" bear testimony to the rare tact and charm of Asche.[41]

The changes in management made in the affiliates of Det Danske, though sweeping, were brought about in conformity with William Donald's earlier admonition in a similar situation: "We do not wish any friction or undue tensions."[42] In one company a son succeeded an aged father, and the other names also had Scandinavian sounds appropriate either to Sweden or to the newly independent Norway. As if to prove that harmony and local co-operation were more important than rapidity of change, Krooks, Sr., stayed on as manager of a company at Stockholm, although he was over eighty years of age and Det Danske held the controlling interest.[43] Krooks alone kept young Holm from being the eldest manager of any of the Scandinavian affiliates in 1910.

In several ways the flow of ideas from America influenced the management and policies of the European affiliates, although the degree differed from one company to another. The most significant change was the introduction in some countries and the speeding up in others of the "American bulk system of distribution," discussed in the next chapter. More detailed reports were sent to 26 Broadway from the affiliates, and the latter received advice on a number of their practices and policies.

Executives in New York asked to be well informed on certain practices. Appropriations for expenditures, apparently all those over $5,000, were submitted to 26 Broadway for approval. Managers of foreign affiliates forwarded estimates backed by the reasons for them and appropriate departments of Standard Oil carefully scrutinized them, in the light of the latest technology. The marketers in Room 702 were often "agitated" at the high costs of Italian plants; letters of explanation to the American director of Italo-Americana pointed to the local conditions, especially the strict ordinances.[44]

When the Oder River was being deepened in 1904, DAPG asked 26 Broadway to approve appropriations for tank barges. In reply to the scrutinizing committee's inquiry for information on the savings over railroad freight, DAPG pointed out that the change was from river transport in barrels to tank barges and was for the twofold purpose of introducing delivery in bulk and for effecting other economics; the Oder was frozen in winter and leakage from barrels long stored in pits was high. No argu-

ments could have appealed to New York more. Within a year eight bulk barges carried kerosene from a forwarding station at Breslau to Cosel in the highly competitive area of Upper Silesia.[45]

Increases planned on salaries over $600 per annum were also submitted to New York. Some years passed before all companies reported regularly. In extant correspondence only one adverse answer on a proposed salary increase was registered and that merely a suggestion for a delay until a young man had proved himself.[46] Top management acted as a check by asking for facts and never exercised a veto to which it had no legal right.

Particular local conditions or the predilections of managers led to many departures from general policies suggested by Standard Oil. In general top management recommended companies' bonding employees, paying managers a regular salary without commission, and not insuring property with commercial companies. While Anglo-American assumed the risk on a ship and cargo up to $500,000, American Petroleum preferred to carry partial insurance more generally. DAPG carried self-insurance on tankers from 1893 onward but paid premiums to insurance companies on cargoes. As late as 1911 Holm was insuring those plants which he considered subject to more than average danger because of local conditions rather than following American practice of not insuring fire risks on marketing property.[47] Top management did not like the European practice of compensating a manager according to profits; this so-called *tantième* they thought centered a manager's concern on the short rather than the long run, but for a time some few employees continued to receive pay on this basis from the European affiliates.[48] Heinrich Riedemann thought it inconsistent to drop insurance on property and then to bond employees. This latter practice, which was one only gradually adopted by affiliates, was not followed by DAPG, and William Donald conceded that the company's excellent record showed its ability to select men and the "honorable qualities of the German race."[49]

In 1904 men at 26 Broadway began giving increased attention to the statistical reporting and accounting procedures of foreign affiliates. In that year a special committee under William Donald collected and evaluated information on current practices of depreciation in Europe. After a lengthy study, consultation with Comptroller A. H. Brainard, and the approval of C. M. Pratt, the report was passed on to affiliates with suggestions, in order to give "European friends" the advantage of the wide field of experience of Standard Oil's "Auditing Department."[50] The suggestions closely resembled the existing policies in the United States except

as to the base of calculation, which was to be on the total original cost, as was the practice in Europe, instead of charging off on the depreciated value, as had been done by American affiliates. Rates were suggested for different types of property, although for various reasons several exceptions were accepted in practice.

Companies differed widely in their adoption of these suggestions. At the one extreme was Det Danske. Holm calmly objected to "regular routine-report work" and, satisfied with his own methods of depreciation, declined to follow the suggested uniform practice. He continued for some years to have horses evaluated each year rather than depreciate their value 12 per cent annually. When asked to have Danske's own affiliates report on profit and loss by product, he stolidly replied that the "friendly feeling" of the managers of these companies was more important to him than statistics.[51] Many a tactful letter was written in an attempt to persuade the independent Dane to change his company's accounting to the "more modern and time-saving method" used by all other affiliates. Finally, patience, the difficulties in carrying out a quota agreement with a competitor, the ending of the old contract between Det Danske and Standard Oil, and the increased stock ownership of the latter in the Danish company all apparently contributed to a change in Holm's attitude. In 1910 he wrote an eager letter asking for help in introducing the "American system of accounting."[52]

While other affiliates quickly accepted Standard Oil's methods of analyzing costs in the interest of checking up on waste and emphasizing economy, nowhere were the techniques more enthusiastically and ably applied than in Germany. The close relationship between DAPG and Standard Oil was coupled with the young Riedemann brothers' own intense interest in all phases of marketing; in turn their interest was built on their father's earlier excellent example in developing in the company intensive means for watching details. Weekly cabled reports on sales, data on kerosene leakages, and semiannual analyses of other marketing costs along the lines of the reports made in the United States received constant and usually favorable comment from the American directors of the German company.[53]

As a result of DAPG's establishment of a statistical department in 1904, and its inauguration of a "rigorous investigation" of merchandising expenses during that autumn, the company soon reduced the costs of marketing. Improved tankers, bulk distribution, steel barrels, and strong electrically welded tanks all cut down the escape of kerosene. Total loss

from leakage and evaporation by ocean and barge transportation and at forwarding and distributing stations was cut from .76909 of one per cent in 1906 to .65561 in 1907! The marketers simultaneously reduced other costs, although governmental regulations requiring tanks to be below ground and to meet stringent tests made both the construction costs higher and repairs more expensive than in some other countries.[54]

Through its changes in quotations of prices f.o.b. New York, Standard Oil influenced but did not dictate prices set by European affiliates. Generally speaking, an advance in price in New York brought prompt price increases by those companies in which a large minority interest existed at the time.[55] Some European companies appeared to have a tendency to think largely in terms of retaining existing profit margins. Others, for reasons of their own, did not always follow price changes in the United States. Events in 1907 illustrate the varied reactions of different managers to problems of price.

In changing price quotations f.o.b. New York, Standard Oil had to consider many factors. The conditions of the domestic as well as the foreign markets and the sales to outside buyers for export as well as to its own affiliates were among the matters weighed. In 1907 Standard Oil men in New York raised prices for kerosene several times, in part because Russian oil, which the Americans considered inferior to their own, had been quoted higher in Europe than American illuminating oil for several months. During the summer the increase in price was also influenced by an unusually early seasonal scarcity of supplies, as stocks moved to satisfy winter needs in the domestic trade.[56]

Meanwhile, the affiliates had special conditions in their own markets to consider. In most cases DAPG might have been expected to follow American price movements promptly, for in Germany there were large buyers, including the exporters to the West African colonies, who watched prices carefully and, if the Hamburg quotations did not immediately reflect the rise in New York, would cover their future needs for a long period at low prices. In the spring of 1907, however, a rise in prices did not appeal to the managers of DAPG; they wanted to show a large volume of sales during pending negotiations for marketing quotas with the rival European Petroleum Union.[57] At the same time, in the United Kingdom the British Petroleum Company, the leading seller of Russian kerosene, already had an understanding with Anglo-American and therefore the latter could be expected to follow a New York price change. On the other hand, three years earlier, when Standard Oil, because of a scarcity of gasoline in the

United States, had raised its price one cent per gallon (to eight cents in bulk f.o.b. New York), McDonald had informed New York that he and the other managing directors of Anglo-American had reduced their prices to hold their trade as much as they could. In this and similar cases top managers of Standard Oil agreed that "the local people" were "the only ones in a position to decide."[58] Thus, wholly owned affiliates did not always respond to changes in New York prices so quickly as partially owned units.

The American directors of European affiliates, however, did not hesitate to give suggestions on price. With their concern for "the general interest," these directors sometimes advised against sharp reductions in price for fear of the effects on neighboring markets. At other times recommendations were based on a statistical study in New York, as in 1907, when analysis disclosed that several European affiliates were maintaining a profit margin on gasoline twice as high as that of the companies in the United States and high enough, in the opinion of the analyst, to act as a hothouse for the growth of competition.[59]

Advice to foreign affiliates, however, was always couched in the most general and tactful terms. This was the case in 1907 when Standard Oil was raising its quotation on kerosene. Teagle wrote to Det Danske: "We [Standard Oil] as large shareholders in your company, appreciating the importance of maintaining your present gallonage, recognize and understand that in order to do this it will be necessary for you to meet prices, which may result in some sacrifice of profit."[60] Bearing in mind the Danes' independence, and not ignoring pending negotiations for quotas with competitors in the European Petroleum Union, he added: "We know that you, as good, sound business men realize the important bearing which it [present gallonage] will have upon these negotiations, and will not do otherwise than pursue a policy which will protect to your company your present volume of trade."

All the information and influence did not run in one direction. Some of the European affiliates had some provision for pensions for employees before Jersey Standard had one in the United States.[61] Donald had had some experience in Germany before he headed the special committee to report on and advise concerning policies of depreciation. Technical information especially flowed both ways. The patented revolving Mehlen faucet, a special can, and a pressure filling machine went from Brooklyn to influence can-making in Germany and Holland. The managers of American Petroleum, finding the automatic filling apparatus too slow, taking as

they reported seventy-five seconds to fill ten of the four-liter cans at a time, added intermediate filling chambers. This modification especially appealed to Indiana Standard as a means of cutting down evaporation when canning gasoline.[62]

An example of an idea born abroad was that of holding a semiannual conference of "foreign representatives" in Europe. Sometimes men "at the bottom of the hill," as Sutfield expressed it, felt they did not have all the facts to give them the outlook of those "from the top of the hill."[63] They did not always even know what the situation was in the neighboring market, in spite of regional conferences on particular issues, such as those on the highly competitive Swiss market in 1903. When C. M. Pratt was visiting Europe in 1910, Maquinay of American Petroleum Company complained of this narrowness of information and advanced the idea of a meeting to alleviate the situation. Teagle then suggested the general conference of the men managing European companies which convened in Paris that December.[64] Those attending exchanged information on marketing methods and experience with great satisfaction and proposed that such conferences be held regularly.[65]

The relationships between the Americans and the European affiliates did not always work out smoothly in practice. Mistakes were made and personal frictions arose. Clashes of interests, irritation, and some personal antagonism are all reflected in the outspoken letters of marketers. Acting on advice from New York, DAPG at one time made a quota agreement involving the Swiss market without consulting Italo-Americana, which shared ownership of affiliates in that area. Such an oversight did not go unnoticed.[66] Teagle considered the Anglo-American directors at times too slow and not pushing enough;[67] what they thought of his criticism is not a matter of record. The Belgian directors suggested they would like to have auditors sent to them who knew French. Holm certainly felt resentful occasionally at influence from across the sea, for he was young when he assumed management and not used to any checkrein, however gently handled. When Holm asked Sutfield for copies of his reports sent to New York, Sutfield substituted "Det Danske" for "we," which showed he had been thinking in terms of Standard Oil. In reporting the change Sutfield privately acknowledged that the pronoun was appropriate only for "kings, editors and people with tape-worms."[68]

Yet, while retaining their legal independence, the managers of all the affiliates at the end of the period were themselves more intimately asso-

ciated with the Jersey Standard group and thought much more in terms of the general interest than in 1899. Perhaps the best illustration of this is that Holm had become so identified with Standard Oil that in 1910 he resigned his position as a director of a Norwegian affiliate. Knowing that Socialist opposition to the American combination might prevent the Norwegian affiliate from obtaining a concession for bulk distribution, he sacrificed personal pride for the good of the whole, although he admitted he was sorely tried when he "pulled down his flag."[69]

The welding together of this group of corporations, or, more accurately, of the individualistic leaders of these corporations, had been accomplished on several levels. Supplementing the contacts between European leaders and the men who met as the Export Trade Committee was the sharing of information by those in lower echelons. Regional conferences, the more general ones from 1910, visits from Americans to Europe, trips of European managers to New York for consultation, and their long, factual, and forceful letters all constituted cementing influences between parent and affiliates.

As in the United States, consultation was the essence of arriving at policies for the European market. In this way not only were forceful individuals kept in the organization, but wiser decisions were made on the basis of earlier general experience and knowledge of local conditions. Although legal factors undoubtedly had an influence on the form of procedures, Jersey Standard executives deliberately gave the managers of affiliates their heads, and they in turn contributed their ideas to the policies voiced at 26 Broadway. The cynic might refer to the hidden controls—the possibility of cutting off supply of products (a step which would have been as painful for the parent as the affiliates) or the power of the purse in controlling appropriations—but a reader of the records is impressed by the careful consideration given to individual abilities, ambitions, and feelings. Working problems out together probably proved slower than dictation, but the latter, quite apart from the legal angle, was impossible in dealing with such dynamic European marketers as Holm and the Riedemanns. In the 1890's the European affiliates largely owned abroad had thought of themselves first as buyers, Standard Oil as the supplier. By 1911 Standard Oil had in Europe a group of able, dynamic allies in the management of the various European affiliates. The need for working out personal association was recurrent. Nonetheless, relationships between Jersey Standard and its affiliates had definitely been tightened during this period. The development of teamwork between men at 26

Broadway and managers of European affiliates after 1902 was comparable to Standard Oil's achievements in administration in the United States during the early 1880's. That decision by consultation and co-operative effort produced successful results abroad is borne out by the record in the next chapter.

Chapter 19

Battling for Foreign Markets, 1899–1911

THE TASK of marketers abroad, as at home, demanded constant attention to ever-changing conditions. The scarcity of kerosene at the beginning of the century was followed by excessive supplies as American coastal refineries enlarged throughput to increase output of needed gasoline. The demand for illuminating oil in Europe for the time being fell off as the use of gas and electricity grew. Marketing the newer petroleum products—fuel oil, gas oil, naphtha, and gasoline—called for new methods. At the time that foreign competitors were stronger and better organized than ever before, the American company was under fire as a monopoly in courts at home and had to consider policy abroad in the light of opinion in the United States. Officials at 26 Broadway and marketers in the field, beset constantly by these issues, struggled to attain their major objectives of profits and a strong participation in each national market for the long run. Although there was a similarity in the approach in various markets, each local situation called for vigilance and ingenuity. The work of the marketers was never done.

MARKETING KEROSENE IN THE FAR EAST

After 1898 the managers of Standard Oil gave greater attention than ever before to marketing kerosene to the immense population of the Far East. The Oriental countries became increasingly important as the amount of illuminating oil bought in the Western world failed to increase at the former rate and then for some years declined, at the same time that Standard Oil had growing quantities of kerosene to sell. Marketing in the Far East was a significant phase of Standard Oil's position in world trade; in that area after 1902 it met the combined force of its major competitors who marketed through The Asiatic Petroleum Company.

In the Oriental markets Standard Oil sold through the agents of the Standard Oil Company of New York. Established in the 1890's, these agencies already had acquired valuable experience by the start of the twentieth

century. Here Standard Oil had none of the legal problems of dealing with affiliates. However, since the managers of stations in countries like China and India were far away from even the national head office and needed to adjust to unusual local conditions, they had to be men of initiative. The general managers in the various countries were given a good deal of freedom in making decisions, and their frank letters to 26 Broadway indicate that they did not hesitate to make specific recommendations or to comment on the effect upon their own markets of general policies emanating from New York.[1]

Although some other petroleum products, especially candles and paraffin wax, were not insignificant in the trade to the East, by far the most important petroleum product was kerosene. With the exception of cities in Japan, where electricity made important strides during the years under review, almost every center of population in the East increased its consumption of illuminating oil. Some of the many villages of the hinterlands of China and India experienced the luxury of kerosene in the twentieth century for the first time. The low incomes and low standard of living of the teeming East called for a cheap light, if the mass market was to be reached. W. E. Bemis, writing of the success of a rival's oil in the market of India in 1904, commented: "The little tin lamps without chimneys are the great factor in this country and in those the amount of smoke, smell or light does not seem to cut any great figure."[2]

In the first few years of the new century Standard Oil's position in the Far East was not satisfactory. Production in Burma and the Dutch East Indies was expanding rapidly, but Standard Oil was unsuccessful in getting producing properties in either. New York Standard's International Oil Company, Limited, in Japan proved unsuccessful. Tariffs and long transportation added to costs of American kerosene, almost all of which traveled in cases and cans from refineries on the East Coast of the United States. Russian petroleum from Batum had a freight advantage, especially to India. To their sales of Devoe's famous brand and other Standard White kerosenes, New York Standard's agents added some cheaper Russian oil in the 1890's, but after the Rothschilds had joined in forming The Asiatic Petroleum Company supplies of that oil were more difficult to obtain. Price cutting characterized the years from 1900 to 1902, and the sales of the American company, especially those in China, fell sharply. In 1903 Standard Oil accounted for only about 8 per cent of the kerosene consumed in India.[3]

The Far Eastern marketers of Standard Oil's kerosene set out to improve

their relative position by a number of methods. These were not all introduced at one time and were in part the adaptation of the techniques of mass marketing to a new area and in part a response to particular situations. The pattern, although not unlike that followed in other continents, had a good deal of its own local color. To compete with the low-cost product of the Eastern countries, Standard Oil introduced a second-grade cheaper American kerosene, Petrolite. In the refineries on the Atlantic Coast it was manufactured chiefly from Texas and Kansas crude; in the West, California petroleum was used. It was sold under such catchy brand names as "Monkey" in India and "Sylvan Arrow" in Java. Competitors could "tolerate" the more expensive Devoe brand sold only to the well-to-do, but a lower-priced product meant volume sales for Standard Oil.[4] The Americans installed facilities for bulk distribution where the market justified the expenditure, pushed the sale of oil-burning devices, and took account of the characteristics of the different national markets. As recommended earlier, some managers, notably those in Yokohama, Hong Kong, and Shanghai, shared problems and information at regional conferences. Price wars continued intermittently to 1905, at which time understandings with competitors were reached. Within five years the peace was broken, and sharp reductions in prices marked the years 1910 and 1911.

While considering more far-reaching moves in 1900, Standard Oil lowered its limits for sales in the Eastern markets to meet lower prices of competitors. As C. M. Pratt succinctly expressed the purpose of the action: "We want to keep and enlarge the gallonage rather than increase profits."[5] As a result the stations showed book losses for 1901 and 1902.

The limits given for different markets by 26 Broadway varied for several reasons. Different grades of kerosene were shipped to meet flash-test requirements of governments. For example, Japan had a higher flash-test requirement (115°) than China, which accounted for part of the difference in price. Transportation costs and tariffs varied between markets, as did the amount of competition. The price limits set in the summer of 1901 ranged from 3.25 cents per gallon for Shanghai and Australia, to 3.35 for Hong Kong, to 3.50 for India and Java, and to 4.25 for Japan, where a new high tariff added to cost.[6]

Limits set in New York, partly on the basis of information from agents, did not determine the exact selling price. General managers were free to sell above the minimum if they could do so and hold their trade. On occasion they complained of the spread between limits for different markets, both because they feared the flow of kerosene between them and

because they wished to have the widest scope possible for their own judgment in meeting local conditions. Prices were often above limits; in 1900 and 1901 J. W. Copmann refused to lower his price in Japan for fear of injury to wholesalers who, having had a bad year, were caught with heavy stocks. Price cuts, he agreed, would temporarily increase sales, but, he argued, this policy would "make the trade more timid in handling our goods than if we maintained a more stable value."[7]

The system of bookkeeping itself encouraged marketers to stay above the limit set. The Oriental stations were not billed for new supplies in relation to that quotation. Kerosene was invoiced on the date of charter of a vessel for an Eastern port according to the current price per gallon charged European affiliates for bulk kerosene at New York. To this amount, which was somewhat lower than the open market quotation, were added the costs of preparation for shipping, including canning and casing, and freight. The limit might be below the invoice cost. As Livingston Roe, Jr., explained to Copmann, "You see, therefore, that our selling limits in the various markets have nothing to do with the prices at which we invoice the goods, and the result of the year's business simply shows what cuts in selling prices have been made from our invoice price, or *natural cost*."[8]

If a station sold even somewhat above the given limit, it might yet show a marketing loss, but that did not mean that the kerosene was sold below actual cost to Standard Oil. The "natural cost" covered profits on other functions, including piping. When William Rockefeller, president of New York Standard, gave authority for reducing limits at Shanghai in 1900, his office calculated that if kerosene was sold at that figure it would result in a "net back" to New York yielding fifty-three cents per barrel pipage rather than the sixty-five cents included in the open market quotation. In 1901, c.i.f. price for Russian oil in Shanghai was lower than Standard Oil's limit, and this induced Archbold, in his mantle as vice-president of New York Standard, to reduce the limit for that market again. The Chinese station showed a loss, but the gross return on pipage was calculated back at seventeen cents. That figure would have to be compared with expenses of this function in order to assess the margin of profit or loss for the integrated business on sales in China.

Without data on competitors' costs, it is not possible to compare their profit margins with those of Standard Oil. For the American company, however, pipage rates were the well-padded cushion which made possible the reduction of the margin on refining and marketing without the or-

ganization's suffering a net loss. Lacking this reserve, it is doubtful whether Standard Oil could have gained or held any volume of sales in the Orient, for competitors had relatively low costs of production, inexpensive freights, and, in some cases, protection by a tariff.[9]

By 1901, J. W. Copmann had had eight years of successful experience in organizing the Japanese market and had doubled his sales. In the northern market, sales were made both by the Yokohama office and by three substations—Tokyo, Nagoya, and Hakodate—directly to retailers and also through a combination of jobbers who sold on commission. In the southern district, including Kyushu and Korea, Atlantic oil was sold. There the relation with wholesalers, though friendly, was not so close as it was in the north.[10]

Copmann and his successor in 1907, H. E. Cole, found it necessary to use several methods to maintain sales even in a well-developed market. Copmann consulted with Standard Oil marketers in China. To increase consumption he imported stoves and cooking utensils. He ordered the Tide Water's Chester brand, preferred in the north of Japan, shipped directly to Hokkaichi and Hakodate. In 1900, as discussed in Chapter 17, he encouraged New York Standard to participate in production in Japan. Two years later he supplemented that small local supply by importing Petrolite, sold to appeal to consumers at the time of the Russo-Japanese War under the name of "Victory." A few years later New York Standard sold its refinery and producing properties in Japan, introduced bulk distribution, and by 1911 was importing an increasing quantity of kerosene from California.[11]

One incident, more important for later implications than the immediate interruption to trade, called for action by top management. During the Russo-Japanese War, Russia, following its declaration that "naphtha" was contraband, seized the *Oldhamia*, an English ship loaded with Standard Oil kerosene going to Japan. The cargo was lost. Standard Oil attempted to win compensation on the ground that the shipment was an article of peace. Archbold declared: "It has never before, so far as we can learn, been contended that petroleum might under any circumstances, be considered a contraband of war."[12] The case dragged on until a much larger war involved extensive use of petroleum products and the Russian government, which had performed the seizure, was itself destroyed.

There were other interruptions to normal trade in the Orient in addition to the Russo-Japanese War. As a reaction to the exclusion policy of the United States toward Orientals the Chinese staged a boycott of American

oil in 1905 and 1906. Such incidents, however, constituted no more than temporary disturbances to trade.

In spite of considerable fluctuations in their sales, the managers of New York Standard's stations in China showed a general increase in their business. To develop the vast market of this populous country the general managers, Robert H. Hunt and J. W. Bolles, used many methods. Bulk stations were erected in several centers, new substations opened, and Petrolite appeared as "Eagle" brand, although much oil continued to be either imported in cases and cans or so packaged on arrival in China.

The managers of stations in China provided many examples of individual ingenuity. In Swatow the most prosperous merchants were agents for competitors, and severe price cutting in the jobbing market followed attempts to introduce Standard Oil's kerosene. Its agents constructed bulk storage, appointed native "consignees," bonded them, and reported sales of these agents and their subagents to have risen from 8,000 to 400,000 cases from 1906 to 1911. In some places, as in Wuhu, for example, the hand of the New York company extended into street peddling. Shanghai sought information from Det Danske on bottling, but no evidence is found of its introduction.[13]

Small brass or tin lamps with diminutive wicks provided light for the Chinese at less than the cost of a candle; no lamp used much oil, but the size of the market made China New York Standard's largest Oriental outlet. In good years it consumed more than two million barrels of Standard Oil's kerosene.

In the meantime, to meet the competition of lower-priced kerosene in India, Standard Oil had imported Petrolite and to some extent introduced distribution in bulk. After failing to get concessions to produce in Burma, the Americans had waited impatiently to obtain permission to build bulk stations in India. By February, 1904, kerosene was arriving in tankers to the first receiving tanks. Soon, from the importing station at Calcutta deliveries were being made to twelve bulk stations, and an even greater expansion was made on the West Coast from Bombay and Karachi. Within a year Standard Oil's small percentage of the market doubled. Not all the oil was imported in bulk, and even that which arrived in this economical form was usually canned and cased for delivery where transportation facilities were poor. In India, however, Standard Oil's competitor, the Burmah Oil Company, Limited, was protected by a tariff. Although Standard Oil's sales under Samuel Comfort and Charles F. Meyer jumped in 1905 and continued to remain above the level of 1898, they accounted for no more than 30 per cent of the market at the end of the period.[14]

During these years, however, Standard Oil had achieved an increase in its business in all Oriental markets. The number on the staff of "Asiatic Stations" rose from some forty-five in 1898 to more than two hundred by 1911. Of the five divisions, China, Japan, India, Java, and the Philippine Islands, the first two showed the greatest gain in personnel. The total deliveries of kerosene in all Far Eastern countries increased almost 25 per cent between 1903 and 1908. Standard Oil's share of deliveries amounted to slightly more than 46 per cent of the total in 1908, which was a marked improvement over the 34 per cent at the earlier date. In the period 1899 to 1911 the Far Eastern markets accounted for 35.3 per cent of Standard Oil's net earnings outside North America, which ranked them second to Europe's 53.3.[15]

A measure of the marketers' success was the willingness of competitors to negotiate understandings with Standard Oil. In 1902 its top managers refused to be interested in an agreement with Asiatic for fear of the reaction in the United States. Beginning in 1905, however, after taking over some of the markets lost to kerosene from Russia during that country's internal conflict, Standard Oil entered into various arrangements with competitors.

These understandings were not always to the satisfaction of Standard Oil's own field men. Its agent in Java, P. H. Davis, who had been rapidly increasing sales with "Sylvan Arrow," was not pleased to learn that his company had come to an understanding with Stoop's Dordtsche Petroleum Company in 1906. It gave to the Americans a quota equal only to their current 23 per cent of the market. The earlier agreement of Royal Dutch with Stoop had included a clause providing for changes if Standard Oil was brought into a more general arrangement.

No details are available on the understandings about the Indian and Chinese markets. They were not written and were quite temporary, being subject to termination upon twenty-four hours' notice. In August, 1910, the understanding between Standard Oil and Asiatic was canceled and aggressive competition again dominated the kerosene sales of the Far East.[16] Sellers of kerosene in the Orient, as elsewhere, faced ever-changing conditions, and the year 1910 was one of world-wide conflict in oil.

COMPETITIVE PRACTICES IN EUROPE

Meanwhile, marketers of Standard Oil's kerosene in Europe had been facing an intensification of old problems and the appearance of new ones. At times they were concerned at threatened changes in flash-test requirements. Local regulations as to storage and methods of distribution de-

manded constant attention. While changes in tariffs and their administration were almost routine problems, the agitation for national monopolies in various countries was a more serious threat. As electricity and gas made gains in spite of reduced prices for illuminating oil, marketers competed for a smaller volume of business in one nation after another. Sales of kerosene reached a peak in the United Kingdom for this period in 1902 and in Germany in 1908, while the decline in France started two years earlier.[17] Standard Oil's affiliates met a better-organized and more aggressive group of competitors than ever before. The entire situation called for cooperation between Standard Oil's marketing experts and the European affiliates in the application of the economies of bulk distribution and of other methods for holding their trade.

Competitors of Standard Oil's affiliates gained in strength through combination and through the support of strong financial institutions. In the United Kingdom the Nobels and Rothschilds marketed through the Consolidated Petroleum Company, while other exporters of Russian oil sold through the Homelight Oil Company. The Romanian Oil Trust flashed strongly into that market only for a brief time. By 1902, however, the Deutsche Bank's financial strength supported Steaua-Română. The Galicians organized their export trade committee into OLEX in 1904, as discussed above, and grew in strength. Some Galician oil mixed with Russian entered the European markets through Nobel's Viennese firm, Oesterreichische Naphtha Import Gesellschaft (OENIG). In Germany the Deutsch-Russische Naphtha Import Gesellschaft (DRNIG) sold Russian products. The Pure Oil Company, Limited, under its able leader in Europe, John G. Lamont, provided imaginative competition through its various affiliates in several countries. The Shell Transport & Trading Company, Limited, was interested in the firm of Gehlig, Wachenheim & Company which, reorganized as Petroleum Produkte Aktien Gesellschaft (Petrodukt), aggressively marketed Texas kerosene mixed with other oil. Reduction of the output of Texas crude, losses from price cutting, and other factors caused Shell to withdraw from the Continental kerosene market in 1906. In June of that year, however, a new, large marketing combination, the European Petroleum Union (EPU), brought together the Rothschilds, Nobels, Deutsche Bank, and others interested in European kerosene sales. In the following year Shell and Royal Dutch formed a closer union than ever before.[18]

The sharpness of the rivalry in marketing kerosene differed from place to place and from time to time, but in 1902 it became generally intense.

In 1903 sales of Standard Oil's kerosene were down one million barrels in Europe. More serious than the current relative and absolute decline of the sale of Standard Oil's products in Europe was the threat to their position for the future.[19] Experienced marketers from 26 Broadway went to Europe to study the situation and to confer with managers of the affiliates.

The methods of competitors, as reflected in the letters of marketers of Standard Oil's products, were not particularly unique, but they were successful in gaining business. Many of the practices were undoubtedly fairly common to sellers. Furthermore, in trying to get price concessions from 26 Broadway or in explaining their own loss of business, the affiliates may have exaggerated the nature of the rivalry at times. Even with allowance for such human frailty, however, Standard Oil's affiliates were undoubtedly facing competition of an increased intensity.

Marketers of Standard Oil's products considered certain methods of their competitors particularly successful in increasing sales. A Galician company sold cheaply a scientifically constructed lamp chimney which burned well the seller's oil even when used in an American lamp. Pure Oil successfully introduced tank-wagon delivery in Switzerland. Many competitors kept customers by long-term contracts, by arrangements to sell through wholesalers on a commission basis, or by the free distribution of barrels, tanks, and pumping devices. Sales talks as to the origin of the oil were quite common. Christian Holm asked 26 Broadway if Pure Oil really sold only the vaunted Pennsylvania grade. Petrodukt could boast that it sold American oil; it mixed Texas kerosene with light-specific-gravity Galician oil in its plant on the Rhine, and the product burned well in the mountain air of Switzerland. Straight high-grade American oil had quality appeal, but mixed oils and second-quality kerosene won many customers by price.[20]

Price cutting had lost none of its old charm in gaining business. In many countries the years from 1902 to 1907 were marked by that trustworthy barometer of unfriendly competition, periodic price wars. It took more than one company to make wars, and the responsibility for starting them was not claimed by the Standard Oil affiliates as they complained to 26 Broadway of their many problems.

At regional and other conferences marketers of Standard Oil products discussed devices for holding business. The methods recommended were getting "nearer to the trade" by selling directly to retailers, improving the system of distribution by the use of tank wagons where feasible, introducing delivery in cans directly to consumers, reducing prices, marketing

mixed or second-grade kerosene, increasing sales of oil-burning appliances, buying out or into small rival companies, and coming to an understanding with competitors.[21]

Standard Oil men in general preferred to emphasize quality as a competitive device, and some questioned the wisdom of introducing either a mixed or second-quality kerosene. The amount of Water White marketed in Europe had always been small, and Standard White was regarded as the regular first-quality kerosene there. Managers in New York at first did not wish to push a second-quality oil which might replace sales of Standard White. The Export Trade Committee opposed in principle marketing a mixed oil, a term used at that time to refer to an oil made by adding American kerosene to that of some other national origin.

Many arguments favored introducing new grades of illuminating oil. A mixed kerosene had various appeals: it could be sold more cheaply than American; competitors were supplying it; the trade liked it; and some markets could not be held without it. Those affiliates with commitments to buy quotas of Russian oil particularly favored the mixing practice and won acceptance of their view from New York. Some affiliates preferred to keep their Standard White as a first quality at a stable price and to do their fighting with a Romanian or Russian kerosene not mixed with American.[22]

Competition drove Anglo-American to introduce a low-priced oil. During the vigorous and long price war starting in 1902, its sales fell to about 45 per cent of the market. Anglo-American bought some Russian kerosene in that year, a policy which gave the company supplies at a time of scarcity in the United States, and, according to Paul Dvorkovitz, had the added advantage of helping to steady the disorganized Russian market, the condition of which had intensified the price war. After 1903 Anglo-American imported Petrolite. This second-quality American oil regained for Anglo-American some 20 per cent of the market.[23] Management at 26 Broadway advised the affiliate that it should use Petrolite to hold or win customers who did not want first-quality oil but should not let it serve as a substitute for higher grades.

DAPG refused to market Petrolite in spite of heavy competition. When William Donald tried to persuade DAPG to import the second-quality oil, Heinrich Riedemann argued that his company gained, as did Pure Oil, by being known as selling only "the best." He marketed a small quantity of Water White under the name of Diamant Salon Oel, Berlin Uranïa Salon Oel, and Korff's famous Kaiser Oel, which after 1909 was made from im-

ported kerosene rather than crude. Even DAPG's Standard White DAPOL could be labeled "Garantiert Rein Amerikanische Leuchtpetroleum." Riedemann pointed out that in rivalry with Petrodukt he could boast that he imported no Texas kerosene, a product not yet in good repute in Europe. He wanted American oil to stand for a quality product in his market and, when he introduced a second grade, he preferred it to be of European origin, clearly stated.[24]

In general, however, the proportions of the different grades of American kerosene shipped abroad shifted under the pressure of competition. Whereas Water White, usually stipulated in contracts with railroads and municipalities, rose from 14.2 to 16.8 per cent of all Standard Oil's kerosene exports between 1907 and 1910, Standard White, including Bayonne's famous Royal Daylight, declined from 58.3 to 46.4 in those years. Petrolite went on the European market in 1904; it rose to 27.5 per cent of all Standard Oil's export sales in 1907 and to 36.8 per cent in 1910.[25] The proportion of the lower-grade oil was somewhat less for Europe than for Asia.

Standard Oil marketers pushed sales of suitable burning devices with new vigor in order to stimulate the consumption of their kerosene. In 1901 T. J. Williams, fresh from his successful marketing of stoves in the United States, traveled to Europe to increase their use there. Anglo-American and other affiliates continued to advertise widely and to sell sizable quantities of Perfection's smokeless "blue flame oil cookers" and heaters. Lamps such as the "Rayo" were imported from the United States, although their sales did not reach American proportions.[26]

The use of kerosene for fuel did not grow in Europe as in the United States. In 1902 the managers of DAPG, in an effort to encourage the sale of lamps, stoves, and heaters, organized Petroleum Oefen und Lampen Handels GmbH. After a short life the company was liquidated, partly because its lamp style failed to appeal to the public and partly because a high tariff made kerosene too expensive for heating and cooking in Germany. As Heinrich Riedemann explained to 26 Broadway, "the small German people do not spend money, as a rule, freely for things of luxury, as they do in the States."[27] Germany, although now ranking next to the United States in its per capita consumption of kerosene, averaged only about half as much.

For several reasons "getting nearer to the market" appealed to European affiliates of Jersey Standard as to other importers.[28] If they sold directly to the retailer, they could eliminate middlemen, reduce the price, and by contact, and sometimes by contract, tie the retailer more closely to them-

selves. The chief argument against the policy was the antagonism of jobbers toward it. As recounted in an earlier chapter, the American Petroleum Company and other affiliates had made rapid strides in supplying retailers directly before 1900, but the policy became more general among the affiliates in Europe after that date.

The development was accompanied in part by buying shares in well-established wholesale or jobbing firms. In 1906 DAPG made one of its most important purchases of stock when it bought into Wachs & Flössner Petroleum GmbH, Dresden. This firm, incorporated five years earlier, had been buying supplies from OLEX and Pure Oil and, according to DAPG, had carried on with "increasing energy" a "hateful agitation" against DAPG in Saxony.[29] Italo-Americana, among others, organized some new companies and acquired shares in others, as its area of jobbing extended over Italy, Sicily, Malta, Tunis, and Algiers.[30] To some extent such purchases can be followed in the increase in the number of subsidiaries of the affiliates. (See Chapter 18, Table 44.) In other cases, the acquired company or partnership lost its identity, and its experienced staff was absorbed by the large corporation.

Going into the jobbing business was closely related to the more general adoption of the "American system" of bulk distribution from tank wagons. Where the market was large enough, kerosene could be delivered in bulk more conveniently and usually more economically than in barrels. Delivery into a retailer's store or cellar tanks, supplied free, to which only the company's driver had a key, was one way of holding a retailer. Regular, leak-free deliveries from a tank wagon into a calibrated can had many advantages to retailers and provided sales talks in many languages. Delivery to retailers in barrels or cans was continued in some places where traffic and fire regulations either excluded street tank wagons or forbade filling measures from them on the street. A deterrent to the introduction of tank-wagon delivery in some areas was the relatively heavy cost of introducing it, but its rapid acceptance was hastened by growing competition and the ability of this technique of marketing to hold trade.[31]

Jersey Standard's European affiliates introduced and expanded distribution by tank wagons at different times. Anglo-American delivered more than 50 per cent of its kerosene by horse-drawn wagons as early as 1900. Its Royal Daylight, Tea Rose, and White Rose were delivered by tank wagon or in red cans directly to retail stores. In 1905 it began to use motorized "Thornycroft petrol wagons" for delivery from railroad stations to substations. The company gradually increased its fleet of the "road

oil-tankers," which carried eight hundred gallons instead of the four to five hundred of the horse-drawn wagons.[32] In Germany a few tank wagons had traveled the streets in a limited number of cities before 1900, but after that date, and particularly during the years 1903 to 1906, DAPG rapidly extended the system. A variety of regulations hindered the introduction of this method of delivery in Saxony and parts of Bavaria, but with few exceptions it was successfully in operation over most of Germany by 1909, in which year DAPG introduced tank wagons in Berlin. A year later Bemis, studying distribution methods in Europe, commented on the splendid organization in Germany and remarked that it reflected "very great credit indeed upon the Riedemanns."[33]

In Switzerland delivery by tank wagon and entrance into the jobbing business by subsidiaries of DAPG and Italo-Americana were delayed in consequence of the strong organization of the wholesalers and the fear of antagonizing them. In Switzerland the wholesale markets were delineated by geographic barriers, and the jobbers were strengthened by their ownership of retail outlets. They could play one seller of kerosene to themselves off against another, and in a central position the little nation attracted importers from all sides. Competition in the Alps had all the sharpness of the mountain air. An American marketing expert, F. E. Powell, consulted with the sellers of Standard Oil products in 1904 and helped them to improve their organization. By 1907 much of the area in mountainous, rural Switzerland suitable for tank wagons was served by them.[34] Italo-Americana did not introduce tank-wagon delivery in Italy, however, in the years up to and through 1911.

Perhaps no case illustrates better the importance of personal relations in the successful application of a new method than did developments in the Scandinavian countries. At the beginning of the century distribution continued to be to jobbers in barrels. In 1901 Standard Oil increased its holdings of Det Danske's stock and elected an American director, Charles A. Sutfield, who went to Denmark early the next year and won the confidence of Christian Holm. After a year of effort and aided by visits from James McDonald of Anglo-American and Livingston Roe, Jr., of the Export Trade Committee, Sutfield persuaded the independent Dane to introduce bulk distribution by tank wagon in Denmark. Even then Sutfield moved cautiously. He took to Germany the men who would be responsible for introducing bulk distribution. There they studied the system of DAPG. They returned home "thoroughly posted and enthusiastic on the subject." With the help of an American expert, H. J. Guthrie, they proceeded to

inaugurate and spread the system. They districted Denmark, canvassed prospective customers, ordered tank cars and additional bulk storage, planned stations, applied to the National Railway for land, installed underground tanks and other equipment, distributed shop tanks, and started deliveries as soon as possible. By the end of 1904 the system was well established.[35]

Copenhagen was an exception to the use of tank-wagon distribution in Denmark. There the historic pattern of delivery in glass bottles was maintained, in part as a result of a preliminary canvass of customers. Some ten million liters of kerosene were delivered in bottles each year. Immediately after his first investigation of the market, Sutfield recommended changes in bottling, but Det Danske moved slowly in order not to antagonize the Social Democrats, who were strong in municipal politics and who did not look with favor on labor-saving devices. Det Danske signed contracts with bottling firms and gradually changed the operations of washing, filling, corking, and labeling bottles from handwork to automatic machinery. By 1910 the cost of cleaning and filling bottles had been cut to the equivalent of 79½ cents per thousand. Det Danske itself took over the delivery of kerosene instead of selling to jobbers.

Norway and Sweden lagged behind in the introduction of tank wagons. Customers were long distances apart, and mountains and forests conspired with aged directors to forestall the development of modern methods of distributing kerosene. Of one board of directors Holm wrote that it consisted of "very old and awfully conservative gentlemen." The average age was about seventy. Skanska Petroleums Aktiebolaget, in which Det Danske held 50 per cent interest, got its first tank wagon in 1904. Slowly the system spread in the cities, and by 1910 the managers of Vestlandske, spurred by Holm's own enthusiasm and Det Danske's increased stock participation, were planning to install the first bulk facilities in Norway at Bergen.[36]

Although for a short time Holm himself lost confidence in the method of delivery by tank wagon, he later enthusiastically acknowledged its advantages in holding trade. Impressed by the expense of installing the new system, concerned at the loss of customers, including some co-operatives which were critical of Det Danske for delivering to retailers, and personally touched as his commission declined with profits, Holm declared in 1905 that the new system had "proved a most ruinous thing." Men wrote from 26 Broadway of the importance of the long-run view of strengthening a market rather than the short-run one of immediate profits. Teagle re-

minded Holm that Det Danske's previous high dividends had probably encouraged the strong new competition. "We must take the lean with the fat and unfortunately the past year has been a lean one," Teagle philosophized in 1905. Two years later, Holm credited the introduction of tank wagons with maintaining the business of his company. Marketing costs per American gallon were .00359 of a cent higher than before the introduction of the new method, but many deliveries were directly to retailers. In spite of lively competition from firms associated with Pure Oil and with the Deutsche Bank, Det Danske's sales were only down some 8.5 per cent from its "banner" year of 1902-1903.[37]

Several of the European affiliates of Jersey Standard moved one step nearer the consumer by making sales directly to householders. This tactic, usually begun for competitive reasons, was associated with the introduction of delivery in cans from wagons.

Executives of DAPG entered the business of delivery in cans with reluctance and extended it with doubts only because they felt pushed by the competitive situation. In 1903, F. E. Schütte, one of the older managers of DAPG, smarted under the opposition stirred up in Germany by the entrance of his company into the jobbing business and was distressed by the unfriendly verbal assaults of those who prophesied that the company would be moving into supplying consumers directly. He was alarmed when he heard that American Petroleum intended to introduce delivery by cans into its market in western Germany. James McDonald interceded and, as a result of a joint conference of those concerned, the entry of American Petroleum's subsidiary, Rheinische Petroleum Aktiengesellschaft, into the delivery by cans was postponed a year. Yet two years after the conference the new managers of DAPG felt that to hold their own business against the inroads of Galicians and Pure Oil, who were delivering in cans, they must also enter the field. In town after town the step was taken through associated but apparently independent "can companies," beginning with "Favorit" Petroleum-Kannengeschaft mbH in Cassel in 1906.[38]

DAPG's can peddlers drew on the experience of other companies in the Jersey Standard group. In Switzerland one of the affiliates in which both DAPG and Italo-Americana held shares, Schweizerische Petroleum-Handels-Gesellschaft, delivered some two-thirds of its cans to householders. American Petroleum, which had had years of experience in the can business in Holland through its affiliate, Automaat, gave advice to the Riedemanns. DAPG's leaders studied information on the "peddling" busi-

ness sent from the United States. Some months after DAPG had introduced the technique, Heinrich Riedemann also asked executives at 26 Broadway to send an expert to advise the German company in order that it might avoid the mistakes made in the United States and generally might gain from that experience. Some of those who conducted the can companies in Europe visited the United States, and Richard Dreyer, a German-American, made several trips to Europe. He and others recommended that to cut costs there must be a larger delivery per wagon per day and an increase in the volume of business in summer. He advised centralizing control of the retail business under one man, reducing prices to increase the volume of business, pushing sales of oil-burning devices, especially the new cheap one-burner-model stove, and using heavier horses and more durable wagons similar to those employed in America. This advice was followed in part.[39]

The can business, coupled with other factors, increased the per unit cost of marketing by DAPG after 1908. There were several local explanations for rising costs. Among these were poor roads, a strike by drivers, a new station where volume of business was small, the addition of a wagon without a relative increase in business, and a high mortality rate among horses. After 1907 wages and feed costs rose generally. The impact of "aggressive competition" was even more important in increasing expenses; total costs of a station experiencing an absolute decline in business did not drop proportionately. To meet competition, many additional traveling men were added to solicit trade. An extremely hot summer in 1911, by keeping people out of doors in the evening, reduced sales of illuminating oil and contributed to the increased per unit marketing cost of that year over 1910. Moreover, unit costs were raised because a larger proportion of sales was delivered in small quantities directly to the housewife. There was not enough difference between the price from tank wagons to stores and that from stores to consumers to cover household delivery costs in cans, and some of the associated can companies consequently showed losses.[40]

Despite the rapid growth of the can business in Germany, the improvement in the practical details of operating it, and its aid in holding customers, the venture was not an unmixed blessing. In 1911 six associated companies of DAPG delivered from 140 stations, scattered over Germany, 281,377 barrels of kerosene by cans, compared with 5,559 in 1906. Men at 26 Broadway, estimating that the trade did not pay unless the delivery in a town was at least a thousand barrels per annum, had questioned the

extension of the system to some places and its efficiency in others. After 1906, when Standard Oil moved to give up hidden companies in the United States, the relationship of DAPG with its associated can companies came up periodically for discussion. Heinrich Riedemann expressed certainty that he was operating within the German law. Although the connection was no secret to the trade, he did not wish to announce it more openly. Retailers with whom DAPG had three-year contracts were antagonized by the new policy and some threatened to sue. Riedemann acknowledged in 1910 that he felt that he was "walking on dynamite" and speculated as to what would happen if one of the apparent owners of the can companies died. He was not enthusiastic about extension of the business and felt that his pace had been forced by competitors.[41]

The can-peddling business was one manifestation of the enhanced competition during the second half of the first decade of the twentieth century. The rivalry between DAPG, OLEX, and Pure Oil in household delivery in Germany was intensified by the fact that kerosene companies in several towns struggled for a declining total volume of business after 1908. The installation of central stations for electricity, as DAPG's report expressed it, "greatly harassed" the marketers of illuminating oil in several areas.[42] In part they sought relief from profit-consuming competition by working together.

RELATIONS BETWEEN RIVAL MARKETERS IN EUROPE

Spirited competition influenced the policy of Standard Oil affiliates, as the marketing story of DAPG shows, but in several areas rivalry at times was delimited by understandings with competitors. These were signed by individual Standard Oil foreign marketing units and their rivals. Although minor agreements had been made in earlier years, during 1907-1908 a series of arrangements concluded between the European Petroleum Union and affiliates of Standard Oil more generally modified competition in kerosene marketing.

In picturing competition as price wars followed by agreements, much of the color is lost and the picture oversimplified. The aggressive competition itself, the exact moves made toward bringing competitors together, the timing, and the many steps in negotiations were ever new. The nineteenth-century skill of the veteran Libby was followed by the able negotiating of James McDonald. Still later young Teagle and the European managers of several affiliates of Jersey Standard became the business diplomats. They

faced not only the calm, flexible Frederick Lane, representing the Rothschilds, Dr. Herz, representing the Deutsche Bank, the capable and gentlemanly H. Olsen, who bargained for the Nobels, and the changeable Galicians,[43] but also the imaginative threats of Deterding. The bargaining moves resembled an intricate chess game ably played by both sides. When competitors had respect for the skill and integrity of their opponents, the game was played with a zest which almost appeared to make the winning secondary to the challenging experience.

Events and circumstances after 1898 gradually led Standard Oil marketers on the Continent to a series of agreements with competitors selling kerosene. Several of the earlier contracts between them and local marketers for the Nobels and Rothschilds were either extended or modified between 1899 and 1903. Price conflicts broke out sporadically in different markets at various times. By raising prices during their period of scarce supplies in 1903, Standard Oil units lost, as previously noted, a segment of their market. During the next two years price wars were quite common. Standard Oil men took advantage of the disruption of Russian production resulting from revolution and destruction to win back part of the ground lost, in some cases with their cheaper Petrolite. By 1906 marketers of Russian and Romanian kerosene felt impelled to unite in forming the European Petroleum Union, apparently to some extent for bargaining purposes. After arduous negotiations, in May, 1907, DAPG signed an agreement with Deutsche Petroleum Verkaufs-Gesellschaft (Petronaft), the branch of the European Petroleum Union (EPU) in Germany. Within the next year EPU concluded agreements with all the leading Standard Oil marketing units on the Continent and with some of their subsidiaries.[44]

The understandings between affiliates of Standard Oil and competitors differed greatly in their nature. Generalizations can be based only on the copies of the understandings found. The firms participating either agreed on quotas for each, or, as in several cases, the members of the European Petroleum Union gave up marketing in an area and an affiliate of Standard Oil committed itself to buy a given quantity of kerosene from the Russian-Romanian interests. The Standard Oil affiliate in such cases either paid a premium above current wholesale prices or shared the profits made. Letters referred to the economies effected by reducing the number of marketing units. Often an understanding provided for a basic quota for a short period and made arrangements for different ratios if sales increased in volume. Where several firms continued to market, penalties were levied for exceeding quotas, or the contracting parties agreed to vary their prices

in order to adjust their sales to fit the agreement. With these understandings, after 1907 Standard Oil's kerosene probably enjoyed about 75 per cent of the western European market for illuminating oil and the European Petroleum Union about 20 per cent.

Quite apart from all the problems in working out the technicalities of operating such agreements, other pitfalls almost always appeared. Usually additional understandings were needed to put contracts into successful operation after some actual experience in bookkeeping had brought out different interpretations. Det Danske's accounting, in particular, led to many intricate problems in meeting its commitments to the European Petroleum Union under an involved twenty-four-page arrangement. Moreover, the supposedly neutral auditing company appeared to be asking for an inordinate amount of information. This fact led to the strong suspicion, which could not be proved, that the neutral auditor was a hidden affiliate of a competitor and collecting information for it.[45] Standard Oil had earlier warned affiliates not to bank in the various financial institutions in Europe which were interested in the petroleum business for fear of giving away information.

Close relations between competitors necessitated working out an informal code of fair competition. DAPG discovered that an affiliate of Pure Oil was using information obtained through its relations with Petronaft to quote a price just under that of DAPG. Local managers of Pure Oil admitted that this practice was wrong, but Riedemann remarked: "They seem to consider the whole thing rather a good joke." Indeed, the forceful Riedemann expressed no ill feeling that the respected competitor had got in a good blow.[46] There was a friendly exchange of views and a more careful definition of what was considered hitting below the belt.

The agreements did not eliminate all competition. They only set rules for it for a time and modified the pattern. Usually there was an important group outside. Even when the European Petroleum Union and several Standard Oil affiliates had agreements successfully operative in much of Europe, the Galicians through OLEX offered sharp competition in some areas and Pure Oil remained a spirited rival in others. Among the parties themselves these agreements were often apparently little more than the bells which announced the period between rounds in a boxing match. Each party withdrew to its corner and gathered strength for the next round.[47] Often understandings failed to run their allotted course.

The happy beginning of such a truce and the later uncertainty about the continuance of one are illustrated by two instances. In 1901 Olsen,

acting for DRNIG and OENIG, made a quota agreement with DAPG covering Germany. James McDonald reported the satisfactory conclusion of the arrangement to New York with the remark: "There was a general love feast all around and all were happy. Nine of us assembled around the dinner table—a polyglot lot we were."[48] For the time being there was an understanding about part of the German market. In 1910, when Henri Deterding was threatening to grasp control of the European Petroleum Union, W. C. Teagle and A. C. Bedford, after consultation with C. M. Everest and Heinrich Riedemann in Europe, wrote to J. A. Moffett of the uncertainties of continuing the understandings between affiliates of Standard Oil and the European Petroleum Union:[49]

> It is our unanimous opinion that if Mr. Deterding secured the control of the E.P.U. he would not hesitate, in order to accomplish his purpose, to refuse to carry out the present existing contracts, basing such refusal upon some one of the numerous technical points which are constantly arising from time to time in the carrying out of these contracts, or, if he did not refuse outright to carry them out, he would impose so many objections and restrictions as to make them unworkable, knowing full well that we could not afford to take these contracts into a Court of Law in order to enforce their performance on account of the effect which such a procedure would have upon our legal position in the States.

A quota agreement continued only as long as the contracting parties were satisfied with their shares of the bargain.

Competition in the United Kingdom well illustrates the changing pattern of rivalry. In 1900 the *Oil, Paint & Drug Reporter* characterized the trade there as follows: "At one period the rival producers of American and Russian oils have been acting in concert, at another in antagonism, as best suited their immediate interest or future prospects."[50] Shortly afterward, Anglo-American was caught in the cross-fire of competition between rival Russian groups. In 1899 the Nobels' agent, Bessler, Wächter & Company, had united with the Rothschilds' marketers, the Anglo-Caucasian Company, under the name of the Consolidated Petroleum Company. This group had a quota agreement with Anglo-American, but the other Russian refiners of export oil, apparently not satisfied with prices paid to them, jointly formed the Homelight Oil Company and established tank installations and sales depots in Great Britain. McDonald reported that competition between the two strong groups marketing Russian oil drove prices down so far that the United Kingdom was the least profitable market for Standard Oil. The Shell Transport & Trading Company, Limited, was also active in the market, and price wars raged throughout 1903, 1904, and

1905. Marcus Samuel was reported to have commented philosophically that Anglo-American, doing some 75 per cent of the trade, was taking a loss on a larger share of the market than Shell. Anglo-American, however, was supplying itself to some extent with cheaper kerosene from Russia under agreements with the Nobels, and, furthermore, it calculated that its share of the market was down to 45 per cent. In 1905 Standard Oil reduced f.o.b. prices to increase sales in Europe, but Anglo-American's competitors met the situation. Asche reported to Pratt: "The Market Letters show that the competitors are keeping up the fight and in all cases lead in lowering prices."[51]

In the years 1906 and 1907 several changes occurred in the nature of the market. The exports from Russia had fallen off as a result of the revolutionary troubles in that unhappy country. Probably to defend its position, the Consolidated Petroleum Company joined the General Petroleum Company, in which Romanian refineries and the Deutsche Bank were interested, to form the British Petroleum Company. This English branch of the European Petroleum Union, after difficult negotiations, reached some sort of agreement with Anglo-American. The latter, in the meantime, by introducing a second-quality American oil, Petrolite, had improved its position to about 60 per cent of the market.[52]

All was not quiet on the Thames for long. During 1909 the working agreement between Anglo-American and British Petroleum broke down and sharp competition followed. Other rivals participated in the struggle. Scotch shale interests enlivened the situation by pushing south when Anglo daringly introduced its first tank wagon in Scotland. The Texas Company established an office in London that year, and shortly afterward the Producers' Petroleum Company, marketing for Pearson & Son's Mexican interest, entered the market.[53] According to Teagle, who was critical of Anglo-American's management for not holding its share of the trade, that company had lost to a competitor its most "brilliant" marketer. "He knows our methods and in nearly every case is able to discount to the advantage of his company any new move which we make," Teagle wrote. He acknowledged that his opinion of this general manager of a rival firm "would not be substantiated by the London Directors [of Anglo-American] as they consider him tricky and unscrupulous and claim that he holds his business by underhand methods, secret rebates, etc., but that he does hold it, which seems to me the principal point, they are reluctantly forced to admit."[54] Anglo had neither tying contracts nor can-peddling to help hold customers. The year 1910 was especially one of "intensified trade

tactics." "The great oil war," editor Dvorkovitz observed in *The Petroleum Review*, "will commercially far outshine not a few international differences."[55] Kerosene marketing was a demanding game which resembled poker more than tiddlywinks.

The year 1910 was in general a most uneasy one for the marketers of Standard Oil's kerosene. Apart from the examples of intensified regional competition mentioned in England and Germany, a larger storm was brewing. The Austrian government discriminated against Vienna Vacuum. France levied maximum duties on American products and reduced those on petroleum from the Dutch East Indies. The agreement between Asiatic and Standard Oil covering the Far East broke down. Deterding, disappointed that he had been unable to persuade Standard Oil men to agree to terms that he had proposed during his visit to New York in 1908, uncompromisingly stated that no understanding could be reached for Eastern markets without some settlement in Europe. He threatened to enter the European kerosene market.

The indomitable Deterding had astutely chosen his time. Recently he had acquired additional holdings in producing territory in Romania and leased a refinery there. His chief competitor was embarrassed by circumstances both political and personal which favored Deterding's intentions, as he self-confidently informed Standard Oil men.

The governmental attitude in the United States worked adversely to Standard Oil interests. Affairs in the courts of that country were thoroughly, if not always accurately, aired in the European press, with resulting ill effects upon the opinion of the public and governments toward European affiliates of Jersey Standard.

The illness of Frederick Lane, who for some six years had been the chief manager of the Rothschilds' oil business, was another fact unfavorable to Standard Oil. The aged Jules Aaron, upon whom Lane's responsibilities fell, was disgusted with the kerosene trade and was inclined to sell Rothschilds' interest in the European Petroleum Union. Deterding stated that the French bankers were thinking of disposing of their shares to the Asiatic.

Lane's key position in the EPU had fallen on a man not currently in so strong favor with the Deutsche Bank; hence, friction sprang up in EPU's management and created another possibility. Rumor circulated that Arthur von Gwinner was ready to sell his institution's petroleum business, which constituted a majority interest in both the European Petroleum Union (50.4 per cent) and Steaua-Română.[56] If this rich plum fell into

Deterding's hands, he would be virtually in control of the European marketing organization. He would then be free to decide how far the current kerosene agreements in Europe should or should not be preserved in his company's interests, which would in turn strengthen his position in the Far East, since any fight between his marketing organization and Standard Oil would then involve most of the important world markets.

In the spring of 1910 A. C. Bedford and Teagle were in Europe reporting back to Moffett in order to keep the Big Board thoroughly posted. Should Standard Oil try to buy the Deutsche Bank's petroleum interests to forestall Deterding? The question was analyzed and discussed at 26 Broadway, and Archbold and his associates authorized tentative negotiations and forwarded frequent advices to Europe.

Heinrich Riedemann, who had been selected to open up negotiations with the head of the Deutsche Bank, reported on an interview of May 25. "Realizing that it would be no good to beat about the bush in any way with a man like von Gwinner," Riedemann wrote, "I asked him point blank whether he would consider a sale of his Petroleum interests." "Von Gwinner looked at me for just a few seconds," the report continued, "and then told me that he did not need to let me wait for an answer at all, that they [directors of the Deutsche Bank] had had so much trouble with all their interests in the petroleum business that he was perfectly willing to sell."[57]

Negotiations were carried further at a meeting in Berlin in June. Von Gwinner frankly placed his cards on the table before Teagle and the two Riedemann brothers. Von Gwinner's detailed statement of assets was coupled with disclosure of his philosophy and intentions.[58] The Deutsche Bank's petroleum interests were held by the Deutsche Petroleum Aktiengesellschaft, which fact enabled the bank to have control with a small investment, a technique von Gwinner stated that he had learned from a Wall Street financier. The Deutsche Bank preferred to sell out, not because petroleum was a poor business, but because the managers of the firm were bankers and they did not have the necessary time to devote to the demands of managing this commercial enterprise. Proud that in his seventeen years as a director of the bank it had sold no securities to clients on which they had had to take a loss, von Gwinner was willing to sell at a profitable price only if the minority stockholders received the same terms. He would, of course, need to inform the German government of the contemplated step, so that, if it wished, it could go into the oil business itself.

Teagle, equally open and frank in the discussion, expressed somewhat

different views. Eager as he was for the purchase, Teagle thought it would be unfortunate for the bankers to withdraw all their interest in Steaua-Romăna in view of the Germans' "influence and good will." If the bank removed its name from its enterprises, the advantages gained in public favor through European participation would be lost. Teagle explored the possibility of Standard Oil and the Deutsche Bank working together, perhaps through a holding company which would manage Steaua-Romăna and Romăno-Americana. Von Gwinner explained that his bank's business was to organize companies and to sell shares, not to make industrial investments, and he wanted to sell out, not merely to be free of management.

In New York the subject was discussed intensively for days, almost to the exclusion of all other matters. On June 21 the Executive Committee reached a decision.[59] Extant documents disclose only some of the arguments and considerations. Shares in the European Petroleum Union looked like a good investment. Standard Oil men were surprised that, contrary to rumor in the petroleum world, Steaua-Romăna was not paying dividends out of increases in capital but out of excellent earnings. After deliberation, however, the majority of the members of the Export Trade Committee, although recognizing that the purchase would afford additional protection to Standard Oil's marketing, thought that the facts did not justify the investment. The Executive Committee accepted this recommendation. An unsigned memorandum bearing its opinion read: "Under advice our decision is that pending the decision of our government suit we cannot make the purchase."[60] The shades of the federal court stretched long over Standard Oil's foreign policy.

While the chief reason for not buying the Deutsche Bank's interests appears to have been the political situation in the United States, the almost immediate result of the decision was a political issue in Germany. Within a very short time, agitation for a governmental monopoly of the petroleum business in Germany, considered as early as 1891, flared up anew. Dr. Gustav Stresemann, among others, supported the resolution to investigate the danger of Standard Oil's monopolizing German trade. Both Teagle and Riedemann strongly suspected, as a result of their talks with Deterding, von Gwinner, and others, that these moves were backed by both men mentioned, and Libby suspected a fine Austrian maneuver. The forceful Deterding was looking for a market for his Romanian oil and would like to sell to a German government monopoly. At the same time, von Gwinner was eager to get out of his institution's petroleum in-

vestments and could appeal to other bankers similarly involved to voice their opinions to the German government.[61] Military men looked askance at the necessity of relying upon an overseas supplier in the event of war. German politicians could not ignore the votes of the disgruntled middlemen and retailers whose business DAPG had taken. The public attack indicated that Riedemann's company was paying the penalty for too great efficiency in marketing about 75 to 80 per cent of the kerosene in the empire.

While he realized that the Deutsche Bank's eagerness to sell was "unquestionably a danger," Riedemann philosophically remarked late in 1911: "There is no need for any nervousness and as we have weathered other storms we shall somehow weather this one."[62] Readers interested in checking the accuracy of his prophecy may read the rest of the story in the second volume of this series.

In a very indirect manner Standard Oil did make an important move in Europe a few months after its decision not to buy the Deutsche Bank's petroleum interest. In 1911 Schweizerische Handels- und Beteiligungs Aktiengesellschaft bought the stock of the two European corporations affiliated with The Pure Oil Company, Limited. These owned and operated two tankers and a marketing system in Switzerland, Germany, the Low Countries, and Scandinavia. In a later letter to James W. Gerard, American Ambassador to Germany, Teagle reported the legal truth when he stated that he and four personal friends owned the Swiss company which had made the purchase. He did not add that by coincidence all five owners were directors of Jersey Standard. Undoubtedly, both Pure Oil and affiliates of Standard Oil were tired of the competition, especially in the can business of Germany. Some directors of Pure Oil had been eager to give up foreign marketing for some time, and John G. Lamont apparently had no objection to the sale.[63] Operating duplicate marketing stations abroad for American kerosene resulted in burdensome overhead, at the moment that electric lights were reducing the volume of kerosene sales. Pure Oil in America agreed to sell kerosene for export, just as Tide Water did, without any loss of its independence in management. From a business point of view the move was reasonable, and it had the added advantage of preventing Pure Oil's products from falling into the hands of those who wanted enough supplies for Germany to exclude Standard Oil. Given the political atmosphere of the time in both Germany and the United States, however, the method of purchase, though probably the only one possible, introduced an unsatisfactory air of subterfuge.

In the meantime Standard Oil had taken one extremely positive and open step in 1910; it lowered its price for kerosene several times and advised its affiliates in Europe to follow suit. In addition to the actual decline in kerosene demanded in those markets, the level of price, higher there than in the United States, was attracting several American exporters, particularly Gulf Refining and The Texas Company.

Standard Oil gave a public explanation for its reduction in prices. The production of crude had been increasing for three years at a more rapid rate than the world consumption of kerosene, and at the same time many new petroleum producing companies were springing up everywhere. Although the fuel oil market in the United States was developing rapidly, the stocks were huge, and if markets for products were more developed, a larger amount of valuable fractions could be saved by being removed in refining. Standard Oil, therefore, announced its policy of inaugurating a campaign to increase the world consumption of kerosene.

Many factors undoubtedly influenced this policy. Competition had been growing much stronger. Jersey Standard, with a surplus of kerosene to sell, faced a reduced market. Standard Oil's sales in China had recently fallen sharply; rivals appeared to be obtaining an increased share in the declining consumption of kerosene in Germany; Deterding in conference with Teagle had occasionally inserted "one of his random statements" that Standard Oil "was forcing him into the kerosene business in Europe."[64] Another kerosene price war had been declared. As in the case of many wars, it was not easy to decide who had begun it, but its existence challenged all contenders to strengthen their positions. As discussed elsewhere, Standard Oil's bargaining position in the gasoline market had been improved with the advent of new crudes, larger pipeline facilities, new refineries, and improved methods. On the other hand, tariff changes in the United States in 1909 and the legal crisis for Standard Oil at home made more likely Deterding's entry into the United States.

Reduced prices in New York, among other factors, had an effect on both prices and volume of sales of kerosene abroad. Quotations in America influenced those of Jersey Standard's affiliates in Europe, as reflected by the returns of marketing in DAPG's territory. On sales in that area Standard Oil's actual net realization in New York fell from the highs of 6.92 cents per gallon in 1903 and 5.54 in 1909 to 4.78 in 1910 and 4.85 in 1911. Total quantity of exports of kerosene, which had declined for two years from the peak in 1908, were almost equal to that high by 1911, although the value was considerably less.[65]

GROWING IMPORTANCE OF NEW PETROLEUM PRODUCTS

During the years under review alert marketers needed to take steps to increase the volume of sales of petroleum products other than kerosene. The attention given to lubricants and wax has been discussed. Artificial gas plants in European countries called for large quantities of gas oil to use with coal to enrich their products. A petroleum of similar qualities was needed by the new Diesel motors in which Europe was pioneering. Marine use of fuel oil expanded rapidly. Several companies followed the example of the Hamburg-American Line which adopted fuel oil in 1902. The British Navy, after a long series of experiments with the new fuel, fitted some battleships to use it in 1903. Three years later it installed oil-burning apparatus in more of its vessels, built storage depots at various ports, ordered an oiler to service ships at sea, and placed large contracts for fuel.[66] Supply and price had been deterrents to the more general introduction of fuel oil, but, as new petroleum fields with cheaper supplies of suitable crude were opened up, lower prices attracted new customers. At the same time, the growing demands of factories for naphtha and gasoline products were surpassed by the needs of an increasing number of automobiles and trucks. The urgent demands of the many new customers for gasoline called for new marketing techniques.

Standard Oil played a less active role in both gas oil and fuel oil sales in Europe than in other petroleum products. In 1906, the only year for which relative figures are available, the combination accounted for only 60.2 per cent of the exports of gas oil from the United States. Standard Oil's total shipments of this oil to Europe during 1910 amounted to 1,091,333 forty-two-gallon barrels, mostly to Anglo-American, which also bought all the 197,067 barrels of fuel oil shipped by Standard Oil to Europe that year. The English company also purchased about a thousand barrels of "Roadoleum," an asphalt product used either as dressing for the surface of roads or as a binder in construction.[67] None of these totals included either the gas oil marketed by affiliates but bought in Russia or the fuel oil which the British Admiralty purchased from Româno-Americana.

Several reasons accounted for the lack of development of Standard Oil's exports of these products abroad. Competition was sharp in both fuel oil and gas oil, and rivals, especially those shipping directly from Port Arthur, Texas, sold products at low prices. Affiliates, such as the

American Petroleum Company, which made a careful study of the gas oil business in their markets, found specific conditions which made selling difficult; the gasworks often wanted long credit terms and stated rigid specifications.[68]

When Holm was urging Teagle to quote a lower price for a fuel suitable for Diesel motors, the Eastern refiners in the United States gave an example of their problem in meeting special orders. In 1904 they were currently receiving many new types of crude oil and were uncertain about the characteristics of their future supplies. Given these circumstances, they did not feel able to guarantee an adequate output of an oil similar to their "regular Northern gas oil" of the opaque color necessary to enjoy a low classification under the Danish tariff.[69] Standard Oil marketers had developed a sufficient and more profitable market for gas oil and similar products at home.

Some men within Standard Oil, however, felt that the organization was too slow in pushing sales of fuel and gas oils abroad. Holm might have been conservative in changing methods of marketing kerosene, but with his great enthusiasm for the future of Diesel motors, he thought the Americans lacking in imagination on this score. Vacuum Oil, given its interest in lubricating marine engines, was eager to push fuel oil marketing, especially since its competitors were offering a combined sale of these needed commodities. "I feel that we are making a mistake in Europe in regard to this Fuel oil development," C. M. Everest wrote to Bemis. "I believe it will before a very great while be second only to the Refined oil business and the 'other fellow' appreciating this is getting his distributing facilities, while we . . . are 'asleep at the switch.'"[70] It is not known how much the urging of Holm, the criticism of Everest, and the impatience of the expansive manager of Italo-Americana's affiliate in Malta to sell fuel influenced renewed attempts to push these products. The whole competitive situation in Europe after 1909 favored additional vigor in supplying the market with gas oil and fuel oil.

Standard Oil affiliates responded to the stimuli. In 1909 American marketers wrote enthusiastically of prospects. They informed European companies that they were "anxious to secure Gas Oil business" and desired to get in "as close touch as possible with this trade." James Donald, experienced Jersey Standard marketer, reminded affiliates that gas oil and fuel oil were products sold on a "very close margin, being practically a residue that must be disposed of."[71] Affiliates, who for some years had been signing supply contracts with navies, pushed them more

vigorously. They sent to New York for approval of appropriations for new fuel oil tankage, especially at ports. In 1910 Anglo-American issued a "profusely illustrated" pamphlet extolling "Liquid Fuel: Its Uses and Advantages as a Substitute for Coal." Even in the great coal-producing country of England, Anglo-American discussed the merits of liquid fuel for metallurgical processes. The petroleum marketer indicated that it might soon build pipelines to serve industrial centers.[72]

These belated efforts failed to produce marked results before 1912, however. The available statistics for the early years of the century show that the sales of American gas and fuel oils by Jersey Standard's foreign affiliates were comparatively small.

More effort was devoted to meeting the rapidly rising demand for gasoline and naphtha. Automobiles, trucks, and busses, as well as factories, called for increasing quantities of naphtha cuts which were sold in various countries under different names, including "petrol," "benzine," and "motor spirits." At the English Motor Show of 1909 Anglo-American displayed "areo-naph" to appeal to a new customer, the "areo-plane." Affiliates of Standard Oil needed to attract all these users for the markets of the future. Although the vast demand of a half-century later hardly could have been predicted in 1900, the rapid growth within the next ten years was challenging enough.[73]

Standard Oil faced a problem in supplying its affiliates with gasoline during the first decade of the century, as discussed above in Chapter 17, but the affiliates saw clearly that they must push sales to assure their position for the future. Contracts with Shanghai Langkat Company, which had stayed out of The Asiatic Petroleum Company, and purchases from that great rival itself, provided some supplies for Standard Oil's affiliates in Europe. Gasoline from Romania helped to fill some needs in Italy, southern Germany, and the United Kingdom. Late in the decade Jersey Standard's own new Bayway Refinery, with crude running through long pipelines from Oklahoma and new refining techniques which reduced odor, was able to increase its volume of products for export.

In handling and marketing gasoline, all the European affiliates faced similar problems. Shipments and storage of gasoline in bulk called for more and modified tankers, increased port installations, extra tank cars, and additional storage tanks. All marketers had to adjust to a variety of regulations. While barges carrying kerosene were usually permitted to pass through locks on canals in Germany, the less-known and more volatile gasoline had to go in steel barrels or take another route. Anglo-

American had to discharge its supplies at Thames Haven instead of carrying them up the river to its installations at Purfleet. Getting permission to store gasoline near cities was frequently difficult. In Berlin, for example, where storage facilities were controlled by a rival syndicate, DAPG had only a few underground tanks as late as 1910.[74]

DAPG's marketing success, which led to the need for increasing the number of rerun plants in Germany, was to some extent based on its moving closer to the consumer. When the kerosene merchants, who were the minority stockholders in DAPG's subsidiary, Königsberger Handels-Compagnie, showed little interest in selling gasoline, the parent corporation undertook to market the light product in eastern Germany and to pay its subsidiary one-fifth of the profit. Heinrich Riedemann arranged that salesmen of naphtha products who visited chemical works should have at least an elementary training in chemistry. Beginning in 1906 the can companies sold gasoline conveniently packaged in cans directly to small consumers. By 1909 the Riedemann brothers stated that a very small percentage of their company's trade in gasoline and naphtha was through jobbers. Some 17 per cent of their deliveries was made in tank cars chiefly to large chemical works, and the 65 per cent delivered in steel barrels was also to large consumers.[75]

One of DAPG's methods of marketing "benzine" brought the company in direct contact with the small consumer. To encourage the buying of the three brands—"Automobilbenzin," "Dapolin," and "Autonapht"—the managers introduced in about 1910 a system which enabled reliable customers to purchase gasoline on credit at a uniform price throughout Germany. On agreeing to fill his needs from DAPG at a stated price, the motorist received a coupon book. This directed him by maps to selected agents with whom DAPG had arranged for acceptance of its coupons. The company redeemed the coupons with new supplies, paid the dealer or garage owner a commission on the volume he had delivered, and billed the motorists every six months. By the end of 1911 DAPG listed 400 agents willing to sell and 5,500 motorists buying under this system, and the company was marketing some of its gasoline from its own retail outlets, including Dapolin stations.[76]

Other Standard Oil affiliates introduced similar arrangements. The American Petroleum Company used a coupon system but without the credit arrangement. Società Italo-Americana pel Petrolio, although eager to deal thus directly with motorists, faced the problem of the great difference in price between the north and south of Italy, found difficulty

in finding reliable agents, and furthermore did not wish to antagonize garages which were friendly customers. Hence, by 1911 only 2 per cent of its automobile gasoline was sold on a coupon basis.[77]

In Great Britain, which after 1907 was the largest consumer of gasoline in Europe, Anglo-American attracted customers in various ways. In the belief that "motor cars have come to stay," at Silvertown Depot on the Thames Anglo-American reconditioned two-gallon cans, painted them the familiar green known to users of "Pratt's Motor Spirit," and, with automatic machinery, filled thirty-two of the cans at a time for distribution to the garages in London and the south of England. Starting in 1901, the company published lists of its selling agents, which within three years totaled 3,500. All the drivers in the spectacular Gordon Bennett race of 1904 used "Pratt's Motor Spirit," and Anglo was quick to supply fuel for other reliability trials. The company's gift to motorists of handsome leather pocketbooks with maps of the United Kingdom was unusual enough in 1905 to be characterized by the editor of *The Petroleum Review* as "one of the most original and useful advertisements we have yet seen."[78] In 1906 Anglo introduced, for busses and other large vehicles, a cheaper, heavier gasoline—Taxibus Spirit (.760 degrees specific gravity)—made from Sumatran oil and marketed in aluminum-coated cans. In spite of the "iniquitous" threepenny tax per imperial gallon put on motor fuel in 1909, sales expanded rapidly.[79]

The American Petroleum Company and Det Danske displayed a similar interest in increasing gasoline sales. The Scandinavian company received some specialized products through Anglo-American, registered the "Pratt's Motor Car Spirit" in Denmark, Norway, and Sweden, and by 1908 had bought a competitor, Nordisk Benzin Compagni, and had established its own special department to push gasoline sales. The American Petroleum Company, starting in 1904, made an effort to increase consumption of gasoline by reducing prices and going after the business of the automobile clubs through its affiliate, Automaat. For the Dutch and Belgian markets the Automaat printed, in four different languages, maps showing the location of its stations and sent hundreds of copies to Standard Oil for distribution to Americans planning to travel abroad.[80]

While these and other innovations were introduced by the affiliates, the New York office also played a part in promoting sales of gasoline in Europe. It collected, digested, and distributed information on the methods used and the problems met by affiliates, supplemented by its own suggestions. In only one case did it consider that catering to the

automobile trade was going too far. The St. Paul Petroleum Tanks, Limited, an affiliate of Italo-Americana in Malta, wanted to start an associated Motor Car Company. The New York director, McGee, advised the St. Paul group that it "should stick to its natural business," adding that Standard Oil did not wish to finance this type of activity. In spite of this advice, the local managers, already dealers in coal on the side, diversified their personal interest by adding a bus and freight business. Their resulting loss must have made them wish New York's advice had been heeded.[81]

In these and other ways, by 1911 the European affiliates of Standard Oil had substantially increased their sales of gasoline. In spite of a number of current problems, they could look back to many past successes and forward to an established market for the future. When the foreign representatives of Standard Oil met for a general meeting in Paris early in December, 1910, they evaluated the entire European "spirit situation."[82]

Conditions varied from one country to another. In France recent losses to the Asiatic were recorded. The American Petroleum Company had a good report to make of Belgium, where its deliveries were increasing and competition was not aggressive, but for Holland the current situation was less satisfactory: the agreement with Asiatic had come to an end; Royal Dutch had dropped its price from the equivalent of fourteen cents to ten cents per liter and was making inroads on sales by the Standard Oil affiliate. Anglo-American reported satisfaction with the increase in deliveries of "Pratt's Perfection Motor Spirit" in tins to garages and proudly advertised its royal patronage. Italo-Americana's contract with Asiatic had a few weeks to run, but negotiations for its renewal had broken down, and in Italy, as in several other countries, the Galicians were offering a lively opposition. In Germany competition was not strong for the moment, although a period of price cutting had only recently been concluded. Had the marketers known it, 1911 was to start with another one.[83]

In general the managers were pleased with the gasoline situation in late 1910, but it was obvious that no company could rest assured in its current position. Where no understanding with competitors existed, there was sharp competition; where a temporary agreement was in operation, past experience must have warned all parties that this, too, was but a passing phase. Undoubtedly all were on the alert for the sudden termination of the agreement and, in the meantime, were taking advantage of the truce to strengthen their bargaining position for future negotiations.

Looking back over the sweep of years since the late 1870's when Standard Oil sent its first agents abroad, the managers at 26 Broadway might well have been proud of their accomplishments in foreign countries. They had met with only moderate success in becoming established abroad as producers and refiners, but in the field of marketing Standard Oil was firmly entrenched through agents and affiliates in many countries. Under able management the affiliates worked closely with 26 Broadway.

While the pioneer period of foreign policy was over, there were many current problems. With the rapid growth of foreign production Standard Oil probably supplied little more than 60 per cent of foreign markets, excluding the Russian and Austrian home trade. This was a smaller percentage than in the 1880's. In the first decade of the twentieth century, competition had grown stronger abroad, as it had in the United States, and was better organized than ever before. A petroleum price war was likely to be world-wide, or almost world-wide, as the events of 1910 showed. By that time the managers of Standard Oil felt restrained in activities abroad by the need to consider political reactions at home, while many of its foreign competitors were supported by their national governments. Furthermore, the carefully knit Standard Oil organization was on the verge of dissolution and its foreign system would be divided into parts. There were indications that successful world marketing in the future would demand greater attention by American companies to developing producing and refining facilities nearer foreign markets for competitive purposes.

The Standard Oil organization, however, could take credit for maintaining a market for American exports during more than a quarter of a century of conflict. It had acted as an export corporation for several outside firms, as well as for its own companies, and it had spread the "American system" of bulk distribution to many lands. The enlargement and maintenance of the foreign market was an important factor in the rapid development of the American petroleum industry in the first half-century of its growth, a fact to be weighed heavily in evaluating the contributions of the Standard Oil Trust and its successor.

Chapter 20

Employee Relations, 1882–1911

THE "desire and ambition of the laboring man are, naturally, to obtain good wages, reasonable hours, permanent employment, a safe paymaster, and a certain interest and consideration on the part of the employer, irrespective of the mere wage given and received. It has been the aim of the company to meet these several conditions, and it has reason to feel that it has done so." Those words of John D. Archbold in *The Saturday Evening Post*, December 7, 1907, indicate that he and his associates were aware of the necessity for voicing some definite principles of employee relations. More important, however, is the question: How were those policies implemented and what did they mean in practice?

The very number of employees demanded that management give some attention to the relationship with them. As early as 1889 the Standard Oil Trust had more than eight thousand workers in its manufacturing establishments alone. By 1907 Jersey Standard and its affiliates employed almost 66,000. At that time by far the largest proportion, more than twenty thousand, worked in refineries and other manufacturing establishments; another thirteen thousand constructed and operated pipelines, pumping stations, and storage facilities; approximately twelve thousand were engaged in domestic marketing and about the same number in marketing abroad. Considerably fewer were employed in producing crude oil and purchasing it. General administration of the whole combination took up the time and energies of over a thousand employees, about a fourth of whom were employed by Jersey Standard itself. The aggregate of Standard Oil workers all over the world exceeded seventy thousand by 1911, double the number reported by Archbold before the Industrial Commission in 1899.[1]

Many factors, in addition to the large number of workers, make an analysis of Standard Oil's employee relations before 1911 difficult. The workers were scattered not only all over the United States but in many foreign countries as well. They included Chinese and Javanese, Germans

and Italians, Colombians and Argentineans in their homelands, not to mention a mixture of nationalities in the refining, pipeline, producing, and marketing operations within the United States. As the office staffs grew, an increasing number of women appeared on the payrolls, particularly as "typewriters" and telegraphers. The workers were employed by many companies. Legal stipulations as to the conditions of work varied from state to state at home and from nation to nation abroad. Actual policies varied from plant to plant; in fact, there were many local interpretations of the Standard Oil tradition of fair labor conditions. For the historian the problem is complicated still further by the lack of adequate data on almost every question posed. Hence, the analysis can offer only tentative generalizations based upon scattered information collected from a variety of sources of varying reliability.

EXECUTIVES AND OFFICE WORKERS

More specific data are available on conditions of work for executives and office workers of Jersey Standard and its affiliates than for any other groups. Beginning on January 1, 1886, the annual salary of every employee receiving more than $600 per year had to be reported to 26 Broadway, partly for the purpose of keeping a record of payments and partly with the aim of reviewing all promotions. Since few salaried employees, other than messengers and office boys, received less than the minimum stipulated for the record, payments of that relatively small number were also reported. The salary books maintained from 1886 to 1901 give quite full information on amounts paid to everybody from the top executives to the latest clerk. After that period data were entered on cards for each individual.[2]

The salaries of top executives were often divided among two or more companies. In 1901 John D. Archbold received $5,000 a year as president of The Solar Refining Company, $10,000 from the Acme Works of the Standard Oil Company of New York, and another $10,000 as president of several producing companies, from the payroll of "John Bushnell, Comptroller," who served as the disbursing agent for a number of corporations. It was 1908 before any part of Archbold's salary was carried on the records of Standard Oil Company (New Jersey), although it began a separate "Employees Register and Pay Roll" in February, 1899.

The salaries of leading executives in Standard Oil were not high and were not increased prior to 1907. In the earlier years John D. Rockefeller received $30,000 and the other Trustees were paid $25,000. As in a partner-

ship, rewards for top management depended in great part on returns from ownership until the time came that the leading active managers were no longer large stockholders. After 1905 neither Rockefeller nor Flagler accepted any salary. The remuneration of other directors was raised in 1907. Two years later Archbold's salary was $100,000, Moffett received $75,000, and A. C. Bedford $50,000. In 1910 both Teagle and Folger were raised to the last-mentioned figure.

Below the top categories the salary range was wide. Although Dodd's salary of $25,000 was only one-tenth of that reported by the press, it was higher than that of most executives, undoubtedly representing the high earning power of lawyers in private practice. In 1886 only forty individuals on the rolls of all the companies associated with Standard Oil received $10,000 or more; the number had about doubled by 1901. At that time, among auditors, one of the better-paid groups on the staff, yearly payments ranged from $1,320 to $5,000, with the average at $2,400. On Jersey Standard's own small payroll in the New York area in 1901, the average annual amount paid a clerk was $960 and a stenographer $1,040.[3] Many salesmen received their compensation partly in salary and partly in commission, and their returns also differed according to the area of their work.

Although the monetary rewards for the overwhelming preponderance of salaried employees were low by twentieth-century standards, they must be evaluated in relation to several other considerations. The price level was declining during the period to 1897, so that until that date a stable scale of compensation meant an actual increase in real income. On the contrary, with rising costs of living, especially after 1900, those receiving fixed salaries experienced an actual decline in their real income. Against that accruing menace to their accustomed standard of living, employees of Standard Oil were able to set off regularity of employment, periodic increases, and the strong probability of promotion.

The growth in operations, the creation of new companies, retirements, and deaths offered many opportunities for promotion to ambitious young men. Though higher positions were usually filled from within the organization as a whole, mobility between the Standard Oil corporations was such that company lines meant little. Many who had started as low-paid technicians, such as gaugers, rose through hard work and ability to more important positions. More than one Eastern pipeline superintendent who had sent in unusually clear analytical reports was found ten years later in a considerably higher position with The Prairie Oil & Gas or California

Standard. Men who failed to fit into one niche, or disagreed with immediate supervisors, usually moved to other components of the organization. Because many of the men had been young when they entered the new industry in the 1860's, the rate of retirement and death speeded up after 1900, just at the time that the rapidly expanding industry itself gave increased opportunities to employees. The obvious opportunities must have stimulated younger executives to display the maximum of vitality and drive.

Some of the promotions were naturally pre-empted by individuals enjoying the proper family connections or personal friendships within the Standard Oil group. Many examples could be given. The importance of friendship with the Pratts in the rise of A. C. Bedford, H. C. Folger, and others has already been mentioned. John D. Archbold's brother, C. W., was head of the Parkersburg Refinery for many years. John F. Archbold, president of The Prairie Oil & Gas Company, was the son of John D. Archbold, and his brother-in-law, George W. Stahl, held the post of treasurer of Indiana Standard after 1894. While men like J. A. Moffett rose through outstanding ability and dogged hard work, no good reason, beyond connection with his elder brothers, has been discovered for carrying Frank Rockefeller on the Jersey Standard payroll at a vice-president's salary after 1899. He had long publicly criticized Standard Oil, so that there was no intent to buy his silence. He appears to have performed no function as an executive, and the only record of his activity which comes to light is his vigorous opposition to termination of his salary in 1912.[4]

Although influence, through either family or friendship, was undoubtedly important in the rise of a number of men, it usually needed to be backed by ability and experience for an employee to go far. There were several successful O'Days in the company, but when Daniel O'Day suggested one of his nephews for an important position in a gas company, neither C. N. Payne nor Elizur Strong hesitated to express frankly his opposition to the appointment. This relative was not in line for the post through experience. "What inducement is it to men who look after the Company's interest," Strong wrote, "if, when there is a vacancy it is filled from the outside, by one who [has] had no practical experience in the business?"[5] A gasman known to have the necessary ability in both public and labor relations got the position. It would have been contrary to human nature for all favoritism to have been eliminated, but, in general, managers watched the development of promising young men and had in mind successors for those in important positions.[6]

In fact, the executives of Standard Oil gave considerable attention to developing new leaders from among employees. Both John D. Rockefeller and Charles Pratt, different in so many other ways, put special emphasis on this task. When reports reached Rockefeller concerning an "arbitrary and exclusive" superior in Cleveland, the head of the Trust wrote a letter to him on the need for giving younger men both information and responsibility in order to prepare them "for the greatest service to the Company."[7] In 1889 Charles Pratt wrote to Rockefeller recommending Walter Jennings for a position which required independence of judgment. "He is old enough and until he has responsibility put on him & he is found to fail I am not sure that we shall call him a failure." Pratt added: "I am sure we have no work so important as the development of young men for such places. We can only make them, by giving them our confidence & putting them under responsibility."[8] Walter Jennings was on the Big Board fourteen years later.

Promotions and increases in salary did not come rapidly enough to satisfy all men. Increasing demands for salary raises occurred as the cost of living turned upward early in the twentieth century. Several pipeline men had raises early in 1903; requests came in from others. Some argued that moves to new cities had increased their costs. Others pointed out how few promotions they had had over many years, one complaining that in his last eighteen years of twenty-six of service he had had only one increase. A superintendent of a division dwelt on the responsibilities and costs of his job, adding: "I believe and understand that it is the wish of the New York officials that their representatives live like gentlemen. We also like to live like other people of our own standing here [Oil City]."[9] Some requests were granted, but on others a penciled "No" ended the discussion and the hopes.

In most cases the lot of the salaried employees depended in large measure upon the thoughtfulness of their immediate supervisors. Tales are told of inconsiderate executives at 26 Broadway who, coming late to work themselves, insisted that clerks who had arrived on schedule should work overtime without remuneration, but such experiences were exceptional.[10] Yet some executives were aloof, hours were long, and remarkably small staffs carried on a tremendous amount of detailed work throughout the years to 1911. It is doubtful that today, with the current working week, an efficient stenographer with an electric typewriter could turn out the number of letters found in the carbon-copy books of the

hard-working Legal Department of Jersey Standard at a time when Mrs. Ophelia Taggart was its only secretary.

Conditions of employment at 26 Broadway improved considerably after the turn of the century. As a matter of fact, workers there had received two weeks' holiday with pay and a half-day off on Saturdays during the summer as early as 1888, but at some unascertained date after 1900 the half-day on Saturday was extended throughout the year and the normal working day ended at five o'clock.[11] Salaries for those on the small but increasing payroll of Jersey Standard itself were raised several times in the first decade of the century. In February, 1899, only sixteen people were listed on the salary roll of the parent company. By December, 1904, this number had risen to 111 and by February, 1911, to 243. Biannual increments were given to those in lower pay brackets, on some salaries amounting to 25 per cent in some years. Other members of the administrative staff employed by New York Standard enjoyed a similar improvement in their remuneration.

A variety of considerations led to these changes. One source credits the five o'clock closing to James A. Moffett, who thought that hour was late enough for anyone to work.[12] Undoubtedly the directors considered the rising cost of living and insistent demands for salary raises when they were shortening hours, making Saturday a half-holiday, and giving added compensation for work done. More than likely, public criticism of Jersey Standard and its affiliates had some effect upon the decision. In a pamphlet of 1907 entitled "From the Employees of the Standard Oil Company to Its Directors and Stockholders," a parody on a similar one from the directors to employees and stockholders regarding the antitrust suit against Jersey Standard in 1906, the employees professed to see a more liberal attitude on the part of their employers as a result of the suit—"ever since they made that jab at you down in St. Louis." Noteworthy was the fact that the tone was bantering rather than bitter.

Some disgruntlement may have accompanied the imposition of restrictive rules by managers of the combination. As it led "to many things," Standard Oil had a policy that none of its pipeline employees should invest in the production of crude oil. When this stipulation was broken by a few of the men in California, a reasonable period was given the men to pull out of their commitments, but no exception was made to the rule.[13] Employee displeasure, if any, did not get into the records preserved.

On the other hand, Standard Oil's management encouraged employees

to purchase stock in the organization itself. Immediately after 1882, executives "worthy of encouragement" were given the opportunity to purchase trust certificates. Rockefeller and his associates not only made the scarce securities available to junior executives and members of the staff but arranged sizable loans to add promising employees to the list of stockholders.[14] Certainly such treatment contributed to the creation and maintenance of a loyal and enthusiastic body of salaried employees.

Examples abound to indicate that loyalty to the Standard Oil organization arose in large part from close personal relationships and sympathetic attention to personal problems over a period of years. Rockefeller took the lead by showing an interest in individual workers of all levels, even when he was no longer active in the organization. A letter to Daniel O'Day illustrates the opinion of some of his men toward him. An agent of a pipeline, having been offered the position of treasurer of two of Standard Oil's competitors—The Pure Oil Company, Limited, and the United States Pipe Line Company—at a good salary after twenty-five years of service with Standard Oil companies, wrote to O'Day for guidance. "I . . . have always felt," he remarked, "that you took a great interest in my welfare and advanced me from one position to another at least as fast as my ability warranted: in fact I have felt that you were my best friend with the Company and feel so still—For that reason I am now asking for your advice personally. . . . What would you advise if it were one of your own sons in the same position?"[15]

The notable *esprit de corps* of Standard Oil employees was no better expressed anywhere than in the letters of the veteran seeker of crude oil, John Worthington. He probably was bitterly disappointed at not being made the general manager of the South Penn Oil Company in 1902, but for years he went on arduous trips to make reports on the possibilities of foreign production. In 1910, after a study of oil lands in Maikop, Russia, he visited Asiatic Turkey. The trip through the Caucasus was characterized by "bad weather, worse roads, vermin innumerable, filth unbelievable, damp beds," and several robberies.[16] The trip to Lake Van in the Mt. Ararat region took nine days of wearisome eighteen-hour marches in a caravan. Worthington personifies the latter as an obstinate "brute" made up of wheels, varied animals, and men swearing noisily in eleven languages. Cold food, as well as the danger of attacks from marauding Kurds, added to the hardships of the journey. In the same letter recording his experiences, the practical geologist commented upon his relationship with Standard Oil:[17]

I often wonder why I am going through all this—hardships, privation and risks of cholera; surely not for the salary. It is not large enough for all this. Well then Why? To begin with I think there is a certain pride in doing anything assigned to me—but greater than that is loyalty to the Old House —Old 26—But stronger than all is my regard for, and appreciation of the friendship of the men who manage the Company's business. They stood by me so loyally and generously—when I was incapacitated so long that I never consider any effort or service of mine sufficient to repay it.

If continuity of employment is indicative of loyalty and satisfaction, Standard Oil salaried workers were relatively content with their lot. Records reveal literally scores of individuals who were employed for ten to fifteen years and more. Turnover of salaried workers in general was very small. Among salesmen in the South and Middle West before 1900—especially in the territories of Chess-Carley and Kentucky Standard, Waters-Pierce, and the Consolidated Tank Line—there was a high rate of separation, however. Standard Oil afforded the best possible school for training merchandisers of petroleum products. A term of service with the giant organization provided a wealth of information upon its methods, and opportunities were innumerable for former employees to enter marketing upon their own account or for competitors.

CONDITIONS OF WORK—PIPELINES AND REFINERIES

For men on all levels of work much depended on the attitude of their immediate superior. Managers reacted in entirely dissimilar ways to similar problems; some were sympathetic to demands from workers, others coldly intent upon maintaining the upper hand. Foremen exercised practically full control over hiring, firing, and general conditions of employment within their jurisdiction, although they were somewhat influenced by policies of those above them. Pressures for change emerged at different times in different parts of the United States and in the different functions of producing, transporting, refining, and marketing. Because of the limits of the material available, evidence on the conditions of work of men employed in the United States on pipelines, and those in some of the refineries, will be used as illustrations of some of the developments in conditions of employment in Standard Oil prior to 1911.

Since the same men occupied the second echelon in pipeline administration from the 1880's to 1911, evidence for the years after 1900 can be taken to represent labor policy within that functional area. There the warmhearted and quick personal response of Daniel O'Day supplemented

the careful fairness of Calvin N. Payne until O'Day's death in 1906, after which Payne carried the burden of maintaining liaison between the top executives and the men in the field. During all those years, in spite of the tremendous growth of their operations, those managers kept alive to some extent the close personal relations with their men which had prevailed in the pioneer days.[18] By so doing O'Day and Payne developed a pride of accomplishment, a cohesion among their subordinates, and a loyalty that would be difficult for a formal personnel department to excel or even to match.

Several additional elements, other than the personal predilections of Payne and O'Day, also affected the pipeline labor situation. Men at or near the top had not all risen from the ranks, but enough of them had done so to give them an understanding of workers' problems without having to take a special course of study. Gaelic clannishness also probably played a part as long as the majority of the workers were Irish Catholics and Scotch-Irish Presbyterians. From the 1890's on, that simple pattern became blurred by the addition of newer immigrants on Eastern lines. In spite of those alterations in the constituency of the labor force, pipeline men continued to display a remarkable cohesiveness as a group. Since Standard Oil managers preferred to lay their own pipe and build their own tanks, rather than to let contractors perform such tasks, consideration for their men undoubtedly rested in part upon a policy which promised to maintain a loyal, continuous, and efficient group of workers.

Careful consideration of workers' welfare stemmed from both unselfish and selfish motives. O'Day evinced interest in all the men under his direction, not only those whose salaries had to be reported to 26 Broadway but also hourly wage earners. When Tide Water took over some of Standard Oil's gathering lines, he asked the new employer to consider the seniority of the men in keeping them. The loss to the men was that Tide Water paid lower wages.[19] Jobs were temporary for many construction workers, but, since much building was being done during these years, efforts were made to move them to new work. For the men this measure afforded greater regularity of employment; for the pipelines it meant the benefit of experienced and loyal workers.

In selecting superintendents for both pipeline and gas companies consideration was given to the ability of candidates in labor relations. The ideal was a man who could keep a tight hand on workers, in order to turn out the maximum amount of work and at the same time arouse that feeling of good-will without which the other was impossible. The mis-

takes made in appointing foremen and supervisors were dramatized by conflicts; evidence of success was hidden in stray remarks in correspondence. When Walter W. Richardson had his first experience in a managerial position in the natural gas business, Elizur Strong wrote with enthusiasm: "As I said, he has a good knowledge of men and is making changes, putting the men at such work as they are capable of doing. A man going into the shop or onto the work now will see a great difference in the hustling good-will shown by the men, compared with eight or ten months ago. He has a good knowledge of what a laboring man should do."[20]

Although wages and salaries for pipeline men in the Mid-Continent region were at first out of line with those in the East, they were raised in 1905. Because of the early uncertainty of the business in this area, and perhaps in part because of the level of general wages in the region, gaugers, strappers, foremen, engineers, and construction men received 15 to 20 per cent less than for comparable jobs in the fields from West Virginia to Indiana. The resulting dissatisfaction, especially on the part of men moved from the Eastern lines, as well as the increased production of petroleum in the region, led to recommendations by managers for an increase in wages and salaries. In January, 1905, the rates were put on a par with those paid in the East for similar work.

In setting wages as well as salaries, consideration had to be given not only to the usual terms for the type of work within the organization but also to those for similar work in a particular locality. In September, 1903, John Page, the manager of Standard Oil's pipelines in California, reported to O'Day that at pumping stations the engineer in charge was paid $100 per month, his two assistant engineers on twelve-hour shifts each $80, while the three firemen and two telegraphers who completed the manning of the station received $70 each. Page recommended that the payments should be increased, since they were not higher than those paid for similar work by other employers. "For the best results," he wrote, "we should pay our men a little more than other people, and then the men will be anxious and earnest to do better work for us in order to retain their positions."[21]

The isolation of pumping stations in California induced particular treatment for the workers. A floating gang, made up of an engineer, a fireman, and a telegraph operator, provided frequent relief from duty in lieu of the two weeks' vacation allowed pumping station men in the East. Cottages were built for the married men, most of whom were willing to have

single fellow workers eat with their families. However, since roomers interfered with the privacy of homes, Page recommended the building of bunkhouses for unmarried men. The expenditure for additional buildings appeared amply justified, as Page expressed it, by the "incalculable return in the way of peace and harmony at our different stations." O'Day forwarded the suggestion to his superior with a note, "I favor this," and Rogers added, "So do I."[22]

Accounts of "jollifications" indicate the solidarity of the pipeline men. Annual picnics for the employees of the National Transit Company, Butler Division, were held at least as early as 1886. The Buckeye and other lines followed the tradition of bringing scattered workers together for social occasions.[23] Interdepartment contests played their part in building morale. A glowing description of a bowling match, forwarded to 26 Broadway, reported that the game, "though sharply contested, was chivalrously conducted and characterized throughout by the friendliest of feeling, the result being hailed by the victors in a generous spirit of forbearance and accepted in a similar spirit of resignation by the vanquished."[24]

Even intellectual and religious interests of workers did not escape the notice of management. By 1891 National Transit provided a special reading room for men in its shops. O'Day was just as quick to make and gather special contributions for a needy Presbyterian church serving a congregation attended by pipeline men as he was to investigate a complaint that Roman Catholic workers were suffering from "local bigotry."[25]

Benevolent toward their employees though many Standard Oil managers undoubtedly were, wide variations in modifying hours and wages pointed up the opportunistic and patriarchal character of their labor policy in general. Scarcity of particular types of workers, wages paid by competitors, rising costs of living, dissatisfaction among the laborers, and recommendations of superintendents all had a bearing upon the timing of decisions. Since pressures usually developed locally and at different times, most wage and hour adjustments accordingly manifested marked divergencies in time and place.

Natural gas operations furnished other illustrations of labor-management relations in the early part of the century. In July, 1902, the Natural Gas Committee met to consider Elizur Strong's recommendation that the wages of field employees should be raised. Rogers approved the suggested raise in wages, but he preferred to increase them even further rather than reduce hours of work from ten to nine per day. As a result

of these deliberations, ordinary labor was paid $1.70 for a ten-hour day and the wages of skilled workers were raised in proportion. By autumn, however, the scarcity of good gas fitters and higher offers from other companies led to additional recommendations from Strong, backed by M. B. Daly in Cleveland. Gas fitters' wages were then raised 10 per cent to $2.75 per day, while those of other workers were given a proportionate boost. In June of the following year, laborers working on a new gas line to Cleveland struck for $2.50 per day but were unsuccessful. In the following autumn Daly was still having much trouble with his gas fitters. Men of this skill were scarce, his rate of wages was not yet so high as that of other companies, and of his sixty-seven gas fitters a number seemed to have an inordinate desire for the bottle. Consideration was given to getting gas fitters from Pittsburgh, but the union required $3.50 for an eight-hour day. Daly chose the alternative of training some new men. By November the situation was apparently smoothed out, for Daly decided to take the vacation which he had foregone the previous year.[26]

Where the statistics have been generalized for the large number of Standard Oil workers in refineries and other manufacturing establishments, the exact geographic differences have been lost, but the range of wages, even for men in the same classification, was sizable. Complete statistics exist for 1889.[27] At that time Standard Oil employed approximately 8,000 of its total of 25,000 workers in manufacturing establishments. The median daily wages paid, taken by groups, ranged from eighty cents for boys under sixteen, who served as helpers, to more than eight dollars for superintendents. Pay for most of the thirty-nine classifications for skilled and unskilled workers showed considerable variety within each category. (See Table 47.) For only a few tasks was the daily wage standardized on a level regardless of period of service or other considerations. A few workers, some coopers for example, received payment by the piece. The median daily wage for all engaged in manufacturing was $1.86. Archbold's belief that wages were "as high and possibly higher" than those in any other company in the oil business was probably true on the average; wages in petroleum manufacturing were better than others in the chemical industry, though not so high as for the iron and steel industry at that time.[28]

Samples of wage data from two different Jersey Standard plants indicate the divergence in basic rates between geographic areas. In 1901 at the Baltimore Refinery the hourly rates were represented by the following sample: foreman of treating, 52 cents; foreman of pipe fitters, 45; pipe

Table 47 DAILY WAGES OF WORKERS[a] EMPLOYED IN MANUFACTURING BY STANDARD OIL TRUST, 1889

Classification	*Number*	*Range of Wages*	*Median Wage*
Boys (helpers, etc.)	328	$ .55 to $1.33	$ .80
Messengers	4	.83 to 2.50	1.00
Laborers	2,838	1.25 to 2.50	1.50
Pressmen	187	1.25 to 2.50	1.50
Car Builders	75	1.65	1.65
Fillers	14	1.25 to 2.62	1.75
Tinners	419	1.25 to 2.50	1.75
Watchmen	95	1.23 to 2.00	1.80
Teamsters	128	1.25 to 3.00	1.80
Boilermakers	329	1.50 to 3.83	1.82
Pumpmen	67	1.50 to 3.33	1.83
Packers & Shippers	51	1.87 to 2.00	1.88
Paint & Glue	18	1.50 to 3.50	1.88
Blacksmiths	39	1.75 to 3.00	1.90
Pipe Fitters	165	1.50 to 2.50	1.92
Boilermen	95	1.50 to 2.50	2.00
Still Cleaners	102	1.50 to 2.50	2.00
Foremen	391	1.50 to 2.50	2.08
Faucet Makers	28	2.10	2.10
Barrel & Stave Inspectors	4	2.12	2.12
Solderers	73	1.50 to 2.50	2.25
Stillmen	247	1.62 to 3.37	2.25
Engineers	78	1.75 to 3.66	2.25
Carpenters	162	1.75 to 3.00	2.25
Miscellaneous Skilled Workers	32	2.25 to 2.75	2.25
Oil Inspectors	14	1.75 to 4.17	2.29
Coopers	1,505	.85 to 3.00	2.50
Machinists	125	1.75 to 3.50	2.50
Box Makers	66	1.16 to 3.25	2.50
Lightermen	25	2.50	2.50
Oil Treaters	48	1.50 to 4.16	2.50
Masons	47	1.50 to 3.33	2.65
Yard Foremen	123	1.60 to 5.41	2.95
Bricklayers	11	1.50 to 3.00	3.00
Candlemakers	9	3.12	3.12
Clerks	287	1.75 to 4.00	3.30
Chief Stillmen	12	4.00 to 4.50	4.00
Lead Burners	3	4.67	4.67
Superintendents	14	6.00 to 8.91	8.33
All Workers	8,258	.55 to 8.91	1.86

[a] These figures include the wages of 520 children under sixteen and 8 women.

Source: Socony Recs., copy of the schedule submitted by the Standard Oil Trust to the Census Bureau regarding manufacturing operations in 1889.

fitters, 29; still cleaners, 23; and laborers, 19, or $1.71 per day. Even six years later, C. W. Archbold, superintendent of the Parkersburg Works, pointed with pride to a wage scale of $1.65 per nine-hour day (18.3 cents per hour) for unskilled labor and a range from $1.80 to $3.00 per day for skilled workers.[29]

On other points C. W. Archbold had real cause for pride. Management of Standard Oil at Parkersburg prescribed no compulsory dealing at company stores, a point which many employers in West Virginia could not make. No order against wages was ever accepted, although, if Archbold followed the practice of pipeline managers, neither was a worker acceptable if he was habitually behind in paying his bills. The Parkersburg plant had been under Standard Oil management since 1875, and, apart from a long stoppage in 1895 when closing the plant was under consideration, workers had had very steady employment.

Generalizations on wages earned in all oil refineries in the United States during the years 1890-1911 undoubtedly reflect the impact of data from Standard Oil units, which manufactured more than two-thirds of the petroleum products in the country for the period. A marked increase in annual money earnings in 1907, for example, reflects the cost-of-living raise given to Standard Oil workers in 1906.[30] Average annual wages of all employed wage earners in refineries rose from a low figure of $432 in 1892 to a high of $706 in 1909. More significant, real income rose with few fluctuations. Taking the average for the years 1890-1899 as the base of 100, the index number for 1894 was 109. Rising costs of living and slight declines in annual pay accounted for a falling off in real income at the end of the decade and the beginning of the new century, but the index had risen to 114 by 1909.

More important than the daily wage in Standard Oil refineries was the regularity of employment. In reminiscence, older employees referred to the stability of work with Standard Oil as a policy which had won their loyalty.[31] In 1889 most refinery workers had a six-day week, and a large number of them averaged 313 days or more during the year. Process men (stillmen and packagers, for example) worked seven days a week, and the fact that the record for 48 per cent of the stillmen shows pay for the full 365 days indicates that a substantial number had what well may be termed "steady" employment.[32]

The working day for the process men was later changed. The schedule varied from plant to plant, but a combination of a ten-hour day shift and fourteen-hour night shift had an advantage over the earlier seven-day-

a-week system: the new method provided a day off every fortnight. At Bayway one week a group worked the ten-hour day shift from 7 A.M. to 5 P.M. on Monday through Saturday and was at work from Sunday at 7 A.M. until the same hour Monday morning, when it was off ten hours until the next cycle started it on the fourteen-hour night shift from 5 P.M. on Monday afternoon to 7 A.M. the next day. This schedule continued through the week until 7 A.M. Sunday, when the workers were off for twenty-four hours before starting their ten-hour day shift on Monday morning. The schedule at Bayonne was slightly different: process men alternated weeks of ninety-two hours and seventy-six, averaging eighty-four hours. Men performing the backbreaking task of firemen averaged only eighty-one hours per week![33]

Refinery workers other than process men achieved one reduction in hours during the years 1882-1911. In May, 1900, the basic day for the Baltimore plant was reduced from ten hours to nine; this schedule of a fifty-four-hour week prevailed eleven years later. Some other plants probably instituted this change at the same time. Just as significant as the reduction in the length of the working day was the increase in hourly rate. The worker received the same pay for the nine-hour day as for the earlier ten-hour day, which meant that he got a higher hourly rate than formerly.[34]

While conditions of labor varied from one refinery to another, some practices constituted general policies. In depression periods, wage rates were maintained, though some layoffs usually occurred. When business was slack, the men with the greatest seniority were kept on any particular skilled job. If men had to be laid off from one task, an effort was made to place them at another within the same plant. "It is a rule that has been rather closely adhered to by almost all of the Works of which I know anything," wrote the superintendent of Bayonne to a supervisor in 1897. "I think you will agree with me that this is only fair and just to the men and is treating them right, and I think further that you will find that men will appreciate an act of this kind and will render you better service for having done it for them."[35]

Not all modifications in Standard Oil labor practices stemmed from enlightened self-interest. Some came through pressure from legislation in a number of states where refineries were situated. There are no available details on the number of children employed by Standard Oil after 1889, when 520 boys under sixteen were working in all its plants, but by the last years of the century legislation had begun to limit the employ-

ment of children. In New Jersey, for example, new laws and tightened administration followed the early restrictions of 1895. By 1902 the state had set a minimum age for boys at twelve and girls at fourteen for factory work, and a child worker under fifteen had to have a school certificate plus a doctor's permission for occupations injurious to health. Hours for all under eighteen were limited to fifty-five a week and ten a day. By 1904 New Jersey forbade factory work for any child under fourteen. When some of Jersey Standard's foremen failed to obey the new law, Standard Oil paid a fine, a factor which did not escape the attention of the press. Some years earlier, because of the interpretation of employers' liability in the courts, the Legal Department of Jersey Standard had advised against the employment of anyone under eighteen in work that was at all dangerous.[36]

Information on Standard Oil's treatment of injured workers has been preserved for all those on the payrolls of Jersey Standard and New York Standard for the years 1899 to 1911. More than half the approximately one thousand accidents resulting in the loss of part of a workday or more during these years occurred at Bayonne, either in the refinery or at the paraffin works, case and can plant, or other departments. Injuries were caused largely by falls, burns, and moving machinery. While slipping on oil led to some accidents, and there were a few explosions, workers were more often hurt when handling barrels or operating automatic devices, such as cap machines.

As reflected in the records of the New York and New Jersey companies, Standard Oil's policy in caring for injured workers was liberal for the time. Workmen's compensation acts had not yet been passed in the states in which the companies operated. Standard Oil's policy was to defray hospital expenses and other costs connected with the injury, to pay one-half the wage for the time lost, and to offer suitable employment to the worker upon his recovery. Quite often more than half-wages were paid, apparently somewhat according to family needs. Legally, under the employers' liability laws the companies could disclaim responsibility if the worker had assumed the risk or if there was contributory negligence on his part or that of a fellow worker. Compensation was often paid, however, in cases where the report characterized the accident as "Company not responsible" and "Own Carelessness," or the facts disclosed that the worker had not worn the protective goggles or other safety equipment provided. Usually cases were settled without resort to court. In one instance a law firm representing an injured worker claimed not that Standard Oil was responsible for the injury but that the worker had not

received from the company "the same consideration" usually accorded to its employees; the injured man received a further sum.[37]

Such generous practices relative to industrial accidents, which appear to have been followed rather generally by Jersey Standard and its affiliates, were to some extent inspired by the advice of the Legal Department at 26 Broadway. At the time of a fatal accident to a worker employed by the South Penn Company, for example, Elliott wrote his customary advice. Given the facts, he did not consider the producing corporation legally liable, but, since the man had lost his life in the company's employ, he suggested that its manager might consider it "good policy and the proper and just thing to do to pay something to the widow for the use of herself and her children."[38] Dodd's reply to a lawyer in the parent company's employ in New Jersey sums up the accident policy of Standard Oil: "If you think there is neither legal nor *moral* obligation to do something in the matter, we will not do anything."[39]

The picture regarding industrial accidents gains detail from the memories of annuitants who recounted their experiences at the Baltimore Refinery during the first decade of the twentieth century. There, as in other refineries presumably, minor injuries were not reported but were treated by the foremen, each of whom had a little medical kit containing iodine and the usual materials found in a home medicine cabinet. Men did not leave work for small disabilities because they were afraid to incur the displeasure of their foremen and because they received no pay if they failed to report for work for two or three days only. Accidents were so few, so said the annuitants, that workers did not think of employers' liability or the need for workmen's compensation. Moreover, any attempt at legal redress would have involved costs in excess of the small financial losses incidental to short periods away from work.

A number of safety measures around refineries—particularly against fire and accidents—also improved the conditions of labor. Management steadily increased expenditures for fire-fighting equipment and circulated among the men rules for eliminating fire hazards. Spacing of tanks and erection of protective obstacles between them were increasingly emphasized after the Bayonne fire in 1900. The provision of goggles and protective shields over moving machinery and the installation of electric lights were undertaken before 1900; such measures were given added attention after that date. To a later generation the steps taken seemed elementary, but the significant fact is that changes for the better were being made year after year.

Memories of old-timers also recorded primitive sanitary facilities at Baltimore until after 1911. A retired foreman of boilermakers said that in those days the company allowed each man a bar of soap a week, normally quite inadequate for a boilermaker because he was positively black by the time he was ready to go home each day. Workers had to improvise their own washing facilities by drawing water from a condenser box into a bucket, taking it to the boilerhouse, and warming the water by sending steam through it. The more energetic men scraped up pieces of wood around the plant and constructed lockers. Toilets were improvised sheds covering a scantling with holes. Modern sanitary installations began to appear in the plant about 1915.

The record on sanitation at Bayonne was better than that at Baltimore, though the Appropriation Book of the refinery showed no entry for the purpose prior to 1903. In that year and later, toilets and washrooms began to manifest a slight statistical effect upon expenditures and undoubtedly more upon the hygienic conditions of the plant. Notable among the early improvements were washrooms and locker rooms for stillmen and still cleaners, the latter having one of the dirtiest, hottest, and most dangerous tasks in the refinery.

Attractive as all improvements in general working conditions may have been to the average worker, the most important single factor in his employment was the relationship with his immediate foreman. That noncommissioned officer of the company played a leading role in employee relations. He did the hiring and the firing. There was no central employment office or centralized wage record. The foreman's wage book recorded the hours worked and the payments merited, which the paymaster's clerk utilized in making the weekly or biweekly wage distributions.[40]

In an organization as large as Jersey Standard and its affiliates, foremen were numerous enough to constitute a cross section of the group in American industry—good, bad, and indifferent. Some were ambitious enough to take correspondence courses or to study in night school at local business colleges or trade schools, learning some mathematics and how to make reports. Others studied mechanical engineering and mastered their jobs so completely as to win promotion to higher ranks in pipeline, producing, and refining operations. The less able and ambitious learned enough to become foremen and remained in that position until retirement. Some handled their crews with affability (suggesting a songfest in periods of disgruntlement, for example) and consideration of personal

problems. Many ruled by sheer brawn, which was sometimes needed to impress workers, many of whom were illiterate and not at all temperate, loved to fight, and were much less intelligent in their approach to personal relations than the great majority of workers of today. A few foremen threw fear into their subordinates by firing one or more of them occasionally, though the blow was sometimes tempered by rehiring them before they reached the gate of the plant.

Much of the latent dissatisfaction among workers centered in the foremen and the system which entrusted so much power to them. Hourly employees had no direct access to anyone above that rank. If a whimsical foreman fired a man out of hand, the worker had no recourse except to seek employment elsewhere in the plant or outside it. Foremen were often accused of keeping time books inaccurately, either through negligence or through favoritism to particular individuals or dislike of others. Although the basic hours of employment were nine, in practice the working day was what the foreman decided, and there was no time and a half for overtime. In the absence of a set time for lunch, employees had to eat when they could or when allowed by their immediate bosses. The letter of the superintendent of Bayonne, quoted above, indicates that "fair and just" treatment of the workers was recommended from above as the best business policy,[41] but much depended on the individual foreman. In the cosmopolitan community of Bayonne the Irish had risen in the second generation to be skilled laborers and foremen. The hard, dirty work was done by more recent immigrants—the Poles, Slovaks, and Italians. Nationality differences and the inability of the immigrants from Eastern and Southern Europe to understand the English of Irish foremen probably contributed to some lack of harmony. Conditions had changed from the 1880's, when almost all the workers were Irish, German, or American and the number of men was small enough to enable executives and supervisors to keep in personal touch with most employees.

In spite of many reasons for workers' dissatisfaction, still stronger reasons existed for their seldom taking concerted action for redress. Not the least important factor was the opportunity for advancement within the Standard Oil family. During the years after 1889, particularly, new refineries were established and old ones vastly enlarged, thousands of miles of pipelines were built and manned, and producing operations were greatly expanded. All this activity created new jobs for foremen and supervisors and some promotions into these categories. Immigrants and less ambitious and younger men came in to take the lower-paid and most

unpleasant tasks, such as the man-killing firing of stills. Conditions of labor within the petroleum industry were relatively good for the times. Fear of foremen, desire for steady employment, the dispersion of producing and pipeline workers in small groups, the advent of many conflicting language groups within the large plants after the 1880's, and the difficulty of organizing large groups all militated against overt expression of grievances. Few of the workers at Bayonne, for example, belonged to unions.[42] Unionism and strikes were also discouraged by two well-known attitudes of Standard Oil management—sympathetic interest in the welfare of workers and resolute determination not to bargain with unions.

According to one account, group action by coopers in the 1880's had been discouraged at Bayonne by two policies of the company. Most of the barrelmakers were skilled Irish and German who worked by hand. During a strike in 1883, new workers—largely Slovaks, Ruthenians and Poles—were hired and the work was soon mechanized.[43]

Three years later discontent on the part of the coopers was treated in a more constructive manner. At the request of the Executive Committee, a joint meeting of the Manufacturing, Case and Can, and Cooperage committees was held on April 2, 1886, to consider the policy which Standard Oil should take in regard to labor questions. A special committee was appointed and instructed "to carefully consider the peculiar situation of the Barrel, or Cooperage Department" and to make recommendations for changes in the conditions which were causing discontent.[44] The increased mechanization of barrelmaking had adversely affected the status of coopers, and, since at that time they comprised 18 per cent of those employed by Standard Oil in manufacturing, the issue was significant. No record remains of the deliberations of the special committee, but a report to the Bureau of Census a few years later showed many coopers working on piece rates and making a good wage for the time; perhaps the piece rate was the answer of the special committee. It did not settle all grievances, however, for the coopers struck at Bayonne again in 1891 for more pay.[45]

Since Standard Oil had very few strikes, and they were always restricted to a small group of workers, it was sometimes stated that the organization was free of such labor disturbance. This was not true, as the meticulous Elliott pointed out to the public relations man, J. I. C. Clarke, when he was eager to make such a generalization. The strike at The Atlantic Refining Company in 1887 occasioned a special entry for expenses. In the nineties there were a number of localized difficulties; in 1894 a fire

in the lumberyard of New York Standard's Oswego Works was attributed by some to striking longshoremen or their sympathizers. In the same year a strike in the refinery at Whiting occasioned comment in the press.[46] As costs of living rose after 1897, there were numerous short labor stoppages. Crews on ships caused trouble on several occasions. Construction men on gas lines near Cleveland struck in 1903. In the same year Baltimore managers experienced a conflict with firemen and Bayonne executives with boilermakers.

The strike at the Bayonne Refinery in 1903 throws light both on Standard Oil's then current policy toward unionism and on the relation of George Gunton to the company. Gunton's magazine, discussed later, was subsidized by Standard Oil, but this economist answered labor's request to present its case to the company. In the early spring of 1903 both the Civic Federation and the representatives of the Brotherhood of Boilermakers, two hundred of whose members were on strike at the Constable Hook plant, asked Gunton to try to get officials of Standard Oil to send a representative to treat with the union. The strikers declared that they were not asking for changed wages or a closed shop, but its members had objected to the discharge of one worker and to the employment of a nonunion man for two dollars when the usual daily rate was three dollars. The union had technically not called the strike, for, although all the workers out were members, their union status had not been recognized by the company.[47] In short, the union was eager to receive recognition from the Jersey Standard.

Gunton gave advice to Standard Oil which, had it been heeded, might have placed the company among the pioneers in one field of labor relations and forestalled later trouble. He argued that if the union was recognized, the company could keep itself clear from the labor troubles which were pending and could preserve its good record of freedom from strikes. It was his opinion that recognition was not only inevitable but would benefit both the employer and employees. But Gunton's request to put his views before an officer of Standard Oil got no further than his conversations with Dodd. The managers also "deemed it was not wise to have an interview with any member of the Union."[48] The strike continued with some show of violence. Jersey Standard hired strikebreakers. A small riot and a few arrests occurred, and the union was not recognized. An acknowledgment of the place of unionism was postponed for several years, but some months before the Bayonne strike Standard Oil executives

had voluntarily introduced a pension plan for the benefit of all categories of workers in their employ.

ANNUITIES

By the turn of the century, companies as long-established as the leading corporations in Standard Oil had a number of older workers for whom top management felt a moral obligation. By 1903 Jersey Standard itself was twenty-one years old. It seemed time to put into written form what had become a practice in some cases—making provisions for workers who had served long and faithfully and were no longer fitted for work.

Prior to 1903, provisions for ill or aged workers and widows had been on an informal basis; hence only scattered evidence remains to show the extent to which managers provided for employees or their dependents. In a number of cases a worker who suffered a long illness, or had to give up his normal work because of poor health or age, was given lighter duties or continued on full or part salary for an extensive period without working. Monthly payments to widows for a number of months, or free rent of a company cottage, while not legal commitments, were not infrequent. Such provisions varied from company to company within the Standard Oil group, according to the consideration of the general managers. On occasion John D. Rockefeller himself inquired about the help given to an old employee.[49]

Though no records remain of the discussions which led to Jersey Standard's first written annuity scheme in 1903, probably the same motives played a part as in the case of other corporations making similar provisions. Inasmuch as Standard Oil was supporting some workers on a "special Salary Roll," there were obvious advantages in making a general plan. The salaries of some other older employees, including a few executives, probably exceeded their current economic production, but, given their many years of continuous faithful service, they could not be dropped without some provisions being made for them. Having a German affiliate, Jersey Standard's executives were familiar with legislation to provide pensions in the Reich. The German affiliate had also made special provisions for some of its salaried employees not covered by the laws. Hence, the managers of the Jersey Company were in a good position to consider the advantage of a pension plan in developing a stable personnel.[50] C. N. Payne and others thought that, as companies grew larger and top managers kept less closely in contact with their employees, executives

tended to be "derelict in looking after old employees" who had been "laid up by sickness."[51] A specific plan would obviate the chances of such mistakes. Whether the managers were influenced by labor unrest occasioned by the decline of real income early in the twentieth century and by other grievances is not known, but there were enough current manifestations to indicate that greater attention to employees was needed to encourage loyal and uninterrupted service.

As would be usual in considering a new although not unique policy, the managers of Standard Oil undoubtedly reviewed what had been done by others. If so, they could trace the noncontributory plans for pensions by corporations in the United States back to 1875, observe the speedup of the introduction of annuity schemes by railroads following 1900, and note the first enduring plan in a manufacturing company started by Carnegie Steel in 1901.[52]

The first pension plan of the Standard Oil Company (New Jersey) provided a percentage of previous wages to workers retired at the discretion of the company. Effective as of January 1, 1903, employees aged sixty-five with twenty-five years of service could be retired at 25 per cent of their average wage or salary during the previous ten years. Those with twenty years of service, and aged between sixty and sixty-five, could request an earlier retirement or be superannuated by the company; in such cases the payment was 50 per cent of the previous average wage up to the age of sixty-five, then it was reduced to 25 per cent.[53] The plan applied both to salaried employees and to those on hourly wages. Department managers made recommendations for retirement if a worker's health or age rendered him "measurably unfit for the service in which engaged."[54] The only formal change made in the plan in the next few years was in 1909, when the qualification of employment for retirement at sixty-five was reduced to twenty years' service and the benefit for the first year was raised to 50 per cent of the average wage for the final ten years. No special pension fund was established; as Dodd expressed it, men were paid out of the "wage fund."[55]

The example of the parent company was followed by affiliates, and the number of annuitants grew rapidly. Within a short time more than sixty companies in the combination adopted annuity plans. Exactly the same wording as that of Jersey Standard was used by the board of directors of The Carter Oil Company when it introduced the plan on May 10, 1904, effective retroactively from January 1, 1903. The plans of some affiliates differed considerably from that of the parent company. During the first

year of operation of the annuity scheme, eleven Standard Oil corporations paid pensions to ninety-six annuitants. New York Standard and Jersey Standard, both just twenty-one years old themselves, put respectively thirty-six and ten annuitants on their rolls in 1903, as the workers' service with other companies in the combination was counted. By December of that year Standard Oil companies were paying pensions at the rate of $67,946 per annum. Eight years later there were 414 annuitants, including those on "special salary," and disbursements were made at the rate of $189,957 a year.[56]

Behind the bare records of annuitants lies much of interest in the early history of Standard Oil. The first person to go on pension was George W. Van Winkle, Jersey Standard's first superintendent of refining at Bayonne, who, suffering from poor health, became an annuitant a month before the official date of the plan's commencement.[57] On January 1 he was joined by Paul Babcock, Jr., who had served Jersey Standard as president from 1885 to 1892 and as vice-president until 1899, and by Clarence Vose, superintendent of refining at the Pratt Works. Soon they were followed by others who had given the combination long service in executive positions. These retirements highlighted the many changes among the men holding managerial positions during the first decade of the century.

An equal amount of human interest is hidden in the records of less-known employees. For the Standard Oil organization, Lucille Moliton, mileage clerk and car accountant for the Union Tank Line Company, became the first woman to retire on the annuity plan. In 1903, at the age of sixty-one, she completed twenty-six years of service. Helen F. Kingsbury, an early stockholder and an employee whose record went back to the Pratt Works in 1872, retired in 1909 at age sixty after thirty-seven years as a shipping clerk. The services of some men began in even earlier days. Captain F. Beacham, retiring in 1903 from the Lighterage Department of Standard Oil Company of New York, traced his record back to 1863 with the F. W. Devoe Oil Company, and Charles Ryan, going on annuity in 1907 at age sixty-eight, dated his fifty years of service to a marketing company bought by Kentucky Standard. There were many loyal employees of long service from the early days of the sixties and seventies with the pipelines, such as the American Transfer Company, and with refineries of The Atlantic Refining Company, Sone & Fleming, Charles Pratt & Company, Bostwick & Tilford, and the firm of Rockefeller & Andrews.

In practice, the application of the scheme appears to have been more liberal than the wording. The sixth clause of the annuity plan read: "The Directors reserve the right at any time to abolish or modify these annuities, both in their general form and in their application to individuals." In fact, no advantage was taken of this safeguard; cases were considered on their merits, and men were recommended for annuities on the basis of "faithful and efficient" service. No evidence remains to show that any worker who fulfilled the service requirements and wished to retire was refused a pension, while a number of men who had failed to reach the stipulations were included on a "special salary roll."[58] The payment of the larger pension of 50 per cent of the wage was also extended for some annuitants beyond the maximum of five years arranged for in the plan. All the decisions concerning these noncontributory pensions, however, rested with the executives.

Though the companies reserved the right to make the decisions, workers, if able to carry on their work, did not all have to retire at sixty-five. In the list of the annuitants were many who went on pension after well over thirty years of service and much more than sixty-five years of age. A mechanic of the Sone & Fleming Works, who retired at eighty-two, had his record broken by a foreman of the National Transit who later retired at eighty-three.

Some of the older workers took the opportunity to ask for retirement. Perhaps no request reflected more the pioneer days of the organization and the closeness of the men who had worked in it than the letter of W. W. Splane. Asking for retirement after thirty-one years of service because he was "worked out and nervous from many years of very active and close application to business," he referred to his start as a telegraph operator in Butler County, Pennsylvania, at the age of fourteen. He later became the director of construction and operation of the telegraph, telephone, and electric light plants of all the great pipelines, gas, and producing companies. In a letter to O'Day he reminisced:[59]

> The work was hard and required energy, sand, and a great deal of diplomacy to carry it on successfully and deal with the many officers and heads of Departments that I was thrown in contact with—some of whom did not have the best of dispositions and would worry and put me in trying positions. The work, however, was a pleasure as I knew I had the confidence and support of yourself, Mr. Payne, D. J. O'Day, Mr. Snow and others.
>
> Some of the young men who will fill the important positions of the future with the Company and who will have a thoroughly established, smooth running business turned over to them will never realize the bitter feeling against

the Company—and sometimes against its employees—in the oil regions in the early days and the difficulties of creating this mammoth system out of the rough; and the broad-minded owners of this great property who profited by it should have the kindliest feeling and respect for their old employees and see that they are generously treated by the new officers, whoever they might be.

The attitude of the men toward retirement, the disadvantages of the new scheme for older workers, and nostalgia for the pioneer days of the past are all reflected in the letters of the pipeline men. O'Day wrote sympathetically to an aging superintendent, expressing regret at being "the instrument" to convey the decision concerning his retirement.[60] On another occasion, when advising an older employee not to press for a raise in salary, O'Day told him that when such requests came up the question was: "What is the age of this man; how long has he been in the service, and why not put him on the annuity list?" O'Day added: "You will understand Tom that great changes are taking place. There are some new elements in the business and they either do not know or have forgotten the old times, and the men who were produced by them."[61]

Current newspaper comments on the annuity scheme were generally favorable. The original intention was to give no publicity to the plan, it being considered inadvisable that "any publication of it be made through the newspapers."[62] S. C. T. Dodd released the facts, however, and newspapers carried favorable reports, as they usually did, on Standard Oil's labor policy. The *New York Journal American,* a rare exception to the approving press, generalized, "The jobs made vacant will not be filled," thereby making itself a careless prophet at the time of a great expansion in employment. On another date, with more imagination than accuracy, a newspaper reported all Standard Oil refineries on Long Island as closing, apparently on the basis of several retirements there.[63]

In the years 1903 to 1911 Standard Oil was beginning to put into more formal shape its provisions for aged workers. Indeed, many more benefited from such consideration than earlier, but, like many things "new" in company policy, it had its roots in the past and it was to be modified and improved upon later.

As the foregoing record indicates, employee relations in the Standard Oil empire were relatively good over the period from 1882 to 1911. Wages, hours, and working conditions varied greatly from one part of the country to another, from one plant to another, and even within a function

in any one plant, depending upon the quality of foremen and higher supervisors. Even the severest critics of Standard Oil, with but few exceptions, praised its labor policy at the time. Strikes were few, short, and of minor importance. William Martin, a labor leader, described Standard Oil's policy late in 1907 as characterized by fair wages, fair hours, permanent employment, and a system of pensions.[64] The annuity plans of Jersey Standard and its affiliates not only were liberally applied but afforded a worthy foundation for the more comprehensive programs which followed. On the other hand, the Standard Oil system was patriarchal, though benevolent; the directors were willing voluntarily to give raises in pay, to reduce hours of work, and to employ union men, but they refused to recognize unions as bargaining agencies. Archbold and his associates had failed to take the advice of Gunton which could have made them leaders in a new labor policy. Standard Oil executives had, in keeping with leaders of other industrial concerns, much to learn in the field of employee relations.

Chapter 21

Financial Operations and Rewards, 1882–1911

WHILE administering the many functions in the petroleum industry in every part of the world, Standard Oil executives necessarily kept their eyes on recurring problems in corporate organization, accounting, finance, and profits, the ultimate objective of their far-flung operations. Some practices remained the same throughout the years from 1882 to 1911; others were modified from time to time. The key policy was self-financing by plowing back profits and by maintaining liquidity at all times. John D. Rockefeller expressed the policy to J. A. Bostwick in 1885: "I think a concern so large as we are should have its own money and be independent of the 'Street.' "[1]

MEASURES IN FINANCIAL MANAGEMENT

Although there were changes in the structure of the Standard Oil combination and in its financial policies, the latter had roots in early practices discussed in Chapter 2, and the members of the combination worked together successfully under the consecutive forms of the Trust, community of interest, and a central holding company. Paralleling the efforts of top management to direct an integrated petroleum business in "the general interest" of the group was the closely knit financial dependence of its members on one another.

As mentioned in other connections, the financial ties were of several types. Top management reviewed all large expenditures of affiliates, a policy which applied to outlays of $5,000 or more. Salary increases were scrutinized in New York. Affiliates depended on other companies within the combination for both long- and short-term financing, and dividends flowed to the parent companies.

As a comparison of Table 48 with Table 30 amply demonstrates, Standard Oil officials changed the pattern of holdings by the parent company between June, 1899, and July, 1911. In general, subsidiaries of the nineteen companies, which had become affiliates of Jersey Standard in

Table 48 LIST OF STOCKS HELD BY STANDARD OIL COMPANY (NEW JERSEY) AND BY ITS DOMESTIC AFFILIATES,[a] JUNE 30, 1911
In thousands of dollars

Affiliate	*Capital Stock*	*Percentage Held*
Aktien Gesellschaft Atlantic (M. 1,150,000)[b]	273.7	60.0
American Petroleum Co. (fl. 10,700,000)[b]	4,301.4	57.5
Anglo-American Oil Co., Ltd. (£1,000,000)	4,867.0	99.9
Atlantic Refining Co., The	4,999.9	99.9
Bedford Petroleum Co., Société Anonyme Française (frs. 1,750,000)	337.8	99.3
Borne, Scrymser Co.	200.0	99.8
Buckeye Pipe Line Co., The	10,000.0	99.9
California Natural Gas Co.	280.0	89.5
Carter Oil Co., The	2,000.0	100.0
Chesebrough Manufacturing Co., Cons.	500.0	55.5
Clarksburg Light and Heat Co.	1,000.0	51.0
Monongahela Development Co.	6.0	100.0
Colonial Oil Co.	250.0	99.7
Connecting Gas Co., The	825.0	49.9
Continental Oil Co.	300.0	99.9
Crescent Pipe Line Co., The	3,000.0	99.9
Det Danske Petroleums-Aktieselskab (kr. 6,800,000)	1,822.2	74.0
Deutsch-Amerikanische Petroleum-Gesellschaft (M. 30,000,000)	7,140.0	99.5
East Ohio Gas Co., The	20,000.0	75.0
Eureka Pipe Line Co., The	4,999.9	99.9
Galena-Signal Oil Co.	10,000.0	72.8
S. T. Baker Oil Co.	150.0	100.0
West Virginia Oil Co.	200.0	48.8
Gibraltar Petroleum Co., Ltd.	24.3	100.0
Gilbert & Barker Manufacturing Co.	40.0	99.3
Hazelwood Oil Co.	350.0	71.7
Hope Natural Gas Co.	13,000.0	100.0
Imperial Oil Co., Ltd., The	4,000.0	83.1
Queen City Oil Co., Ltd., The	200.0	87.4
Indiana Pipe Line Co.	5,000.0	99.9
Interstate Cooperage Co., The	200.0	100.0
Lone Star Gas Co.	3,500.0	24.2
Marion Oil Co.	100.0	50.0
National Transit Co.	12,727.6	99.9
Cumberland Pipe Line Co., Inc.	1,000.0	99.9
Franklin Pipe Co., Ltd.	50.0	39.0
New Domain Oil & Gas Co., The	1,000.0	99.9
Prairie Oil & Gas Co., The	18,000.0	99.9
Producers' & Refiners' Oil Co., Ltd.	250.0	12.0
United States Pipe Line Co.	1,193.9	3.4
New York Transit Co.	5,000.0	99.9
Northern Pipe Line Co.	4,000.0	99.9
North Texas Gas Co.	500.0	64.8
Ohio Fuel Supply Co., The	12,230.3	13.5
Ohio Oil Co., The	15,000.0	99.9

Table 48 (Continued)

Affiliate		*Capital Stock*	*Percentage Held*
Oklahoma Pipe Line Co.		750.5	100.0
Pennsylvania Lubricating Co., Inc.		50.0	60.0
Peoples Natural Gas Co., The		8,500.0	100.0
Raffinerie Française	(frs. 400,000)	77.2	100.0
Reserve Gas Co.		2,225.0	50.0
River Gas Co., The		300.0	100.0
Româno-Americana	(lei 12,500,000)	2,412.5	100.0
Società Italo-Americana pel Petrolio	(lira 10,000,000)	1,930.0	60.0
Solar Refining Co., The		500.0	99.9
Southern Pipe Line Co.		10,000.0	99.9
South Penn Oil Co.		2,500.0	99.9
South-West Pennsylvania Pipe Lines		3,500.0	99.9
Standard Oil Co. of Brazil		500.0	99.9
Standard Oil Co. (California)		17,000.0	99.9
Standard Oil Co. (Indiana)		1,000.0	99.9
Standard Oil Co. (Iowa)[c]		1.0	100.0
Standard Oil Co. (Kansas), The		1,000.0	99.9
Standard Oil Co. (Kentucky)		1,000.0	99.7
Standard Oil Co. of Louisiana		5,000.0	99.9
Standard Oil Co. (Nebraska)		600.0	99.9
Standard Oil Co. of New York		15,000.0	99.9
International Oil Co., Ltd.[d]	(yen 500,000)	250.0	100.0
Standard Oil Co. (Ohio), The		3,500.0	99.9
Swan & Finch Co.		100.0	99.7
Tank Storage & Carriage Co., The	(£30,000)	146.0	99.9
Taylorstown Natural Gas Co.		10.0	30.0
Tide Water Oil Co.		24,000.0	42.5
Tide-Water Pipe Co., Ltd., The		2,000.0	[e]
Tuscarora Oil Co., Ltd.		5,000.0	99.9
Underhay Oil Co.		25.0	98.8
Union Tank Line Co.		12,000.0	99.9
United Fuel Gas Co.		6,000.0	51.0
United Oil Co.		2,000.7	17.0
Vacuum Oil Co.		2,500.0	100.0
Washington Oil Co.		100.0	71.5
Taylorstown Natural Gas Co.		10.0	70.0
Waters-Pierce Oil Co.		400.0	68.6
West Coast Oil Fuel Co., Ltd.	(£100,000)	486.7	69.9
West India Oil Co.		100.0	99.3
West India Oil Refining Co., The		300.0	49.8
West Virginia Oil Co.[f]		200.0	47.5

[a] For list of subsidiaries of foreign affiliates of Standard Oil Company (New Jersey), see Table 44. For functions of companies listed in Table 48, see Table 32.
[b] Accountants of Standard Oil valued foreign currencies as follows: mark, 23.8 cents; florin, 40.2 cents; pound sterling, $4.867; franc, 19.3 cents; kroner, 26.8 cents; lei, 19.3 cents; lire, 19.3 cents; and yen, 50 cents.
[c] Standard Oil Co. (Iowa) was inoperative, but the charter was still alive.
[d] International Oil Co., Ltd., was in process of liquidation; its last producing properties were sold during the last six months of 1911.
[e] Less than 1%.
[f] In process of liquidation.
Source: SONJ, Consol. Acts., 1910, 1911, trial balance of Stock Investment Ledger, June 30, 1911, and morgued records of various companies.

1899 (see Tables 21 and 30), were transferred directly to the parent company. Anglo-American either absorbed its contributory companies, such as the various ship corporations, or sold shares to the parent, as in the case of affiliates in Continental Europe, The Tank Storage & Carriage Company, and the Tide Water units. National Transit remained the outstanding domestic company still having substantial investments in affiliates. As noted in Chapter 18, Table 44, however, the chief European Continental affiliates maintained extensive holdings in subsidiary concerns.

Of the seventy-four companies carried on the Jersey Standard stock-investment ledger on June 30, 1911, holdings by "outsiders" accounted for 25 per cent or more in twenty-four.[2] (Taylorstown Natural Gas and West Virginia Oil Company are not included in this figure, since affiliates of Jersey Standard held most of the stock not owned by Jersey Standard itself.) In nine of the companies in which Jersey Standard and National Transit had investments, outside interests held the majority of the stock. In such cases the relationship between Jersey Standard and the subsidiary was confined largely to dividend payments.

Twenty-two companies in which Jersey Standard and its domestic affiliates possessed holdings in 1899, and later, had disappeared from the accounts prior to 1911.[3] In most cases the properties of the corporations involved were absorbed by Standard Oil units, just as were the numerous local marketing subsidiaries of Jersey Standard's affiliates.

Notably absent from the list of Standard Oil corporations in 1911 were The Manhattan Oil Company, the Security Oil Company, and the Navarro Refining Company (formerly the Corsicana Refining Company). The record of the first corporation had always lain concealed in the accounts of Anglo-American, and the sale or dismantling of Manhattan's pipelines and refinery had been completed for more than two years by 1911. The refineries and short pipelines of Security and Navarro, having been declared a part of a combination in restraint of trade under the antitrust laws of Texas in 1909, had been vested in the Magnolia Petroleum Company, organized in April, 1911. With that limited partnership association Standard Oil Company (New Jersey) had no legal connection after October 26, 1909, a fact which was verified by the courts in 1913, although two executives of the parent company held a large part of the shares.[4]

Changes in the instruments for facilitating the flow of funds within the combination paralleled alterations in the legal structure. The outstanding development after 1899 was that by 1911 Jersey Standard had

emerged as the leading financial entity in the combination, having taken over functions earlier exercised either by the Trust or by other members of the organization.

During the 1880's Standard Oil's top management vested the Trust itself, National Transit, and New York Standard with banking functions for the group. The revenues of the Trust came largely from dividends from contributory companies, from sales of stocks and bonds held, and from interest on loans. In turn the Trust borrowed from New York Standard and through brokers from the call loan market at least as early as 1884. Disbursements took the form of loans to contributory companies, purchases of stocks and bonds, repayment of loans, and expenses of the Trust. Some of the bonds were special debentures of contributory companies, but most of any current surplus was usually invested in United States government bonds or deposited with New York Standard.[5]

The National Transit Company acted as a banker for pipeline, natural gas, and producing companies. The corporation received deposits from subsidiary companies, and between 1881 and 1884 it sold $5,999,000 of its own debenture bonds to the Trust and associated companies as a means of raising capital for its expansion program.[6] Much of its current income was utilized to finance construction of pipelines and to purchase leases, producing properties, and securities. Large amounts of inactive funds were normally deposited with or loaned to New York Standard. Even after the disposition of all the Natural Gas Trust's certificates, National Transit continued to lend money to constituent companies of that organization.

New York Standard was even more of a bank than either of the other two. The sources of its revenues were its own earnings, deposits and loans by associated companies within the Trust, deposits by individual stockholders, and loans from the Trust itself, from the National City Bank of New York, and from brokers.[7] Standard of New York financed its own operations as well as the foreign trade of the combination, including the formation of new foreign companies after 1887. It accepted and paid domestic drafts of associated companies and made loans to them on promissory notes or by purchasing special bonds. Henry Lewis' Crude Stock and Purchasing Department also always carried large book credits for crude oil sold to various manufacturing companies within Standard Oil.

With the exception of the early short-term loans from brokers and banks, all the financing of the Trust's operations was an internal affair. For example, New York Acme owed the First National Bank of New York

over $596,000 at the end of 1885. After this date, however, the combination apparently lent far more money on short term than it borrowed. It was in truth the most independent oil company in the United States.

The channels for the intra-Standard Oil flow of capital were changed to some degree during the years from 1892 to 1899. The Trust ceased to function as a banker, which placed a heavier burden upon the Standard Oil Company of New York. It became the only Standard Oil agency for lending money on call. A major part of the flow of funds to it came from the National Transit Company, whose deposit with New York Standard went as high as $40,703,532 in 1894. New York Standard, according to a memorandum of March 21, 1893, provided funds not only for affiliates but for top managers who had borrowed on demand about a third of the $9,000,000 owed as of that date.[8] A large amount was loaned to brokers and banks. Almost all short-term foreign financing was carried on by the New York Standard, but during this period Anglo-American handled most long-term financial matters for European affiliates. All the producing, natural gas, and pipeline expansion was financed by National Transit, which acted as a deposit banker for the surplus of the same group of units. Inasmuch as Jersey Standard was the recipient of dividends from affiliated companies and enjoyed some profits from its own operations, it was enabled to pay some dividends and to finance its expansion of plant in the late nineties without borrowing to any extent from its banking twin in the New York area.

The Jersey Company gradually replaced Anglo-American as the financial agency for transmitting long-term credit between the United States and Europe. Between 1901 and 1910 the parent company took over from Anglo the holdings of stocks in European affiliates. Dividends from the Continental companies flowed directly to Jersey Standard, which in turn met the needs of direct affiliates for long-term capital.

The National Transit Company manifested a similar decline as a financial agent, though the turning point was more dramatic than in the case of Anglo-American. In 1905 Jersey Standard acquired from National Transit all Standard Oil's interests in three producing companies, ten natural gas companies, and two pipeline companies.[9] Those transfers emphasized the enhanced importance of the parent company in intercompany financial transactions. Thereafter, dividends from the transferred units went directly to the parent company, rather than through the books of National Transit, and the flow of the funds in the opposite direction similarly bypassed the major pipeline affiliate.

In point of fact, the picture of National Transit as a financial intermediary was not quite so simple as the foregoing facts would indicate. As Table 48 shows, on June 30, 1911, it still retained sizable investments in shares of New Domain Oil & Gas, the Cumberland Pipe Line, and other corporations, not to mention almost $18,000,000 in Prairie Oil & Gas. Dividends from those units continued to flow through National Transit. On the other hand, deposit and loan relationships were made directly between Jersey Standard and the three chief subsidiaries of National Transit. At the end of 1911 the Jersey Company still owned $17,000,000 in debenture bonds of Prairie Oil & Gas, and the latter had $1,687,251 on deposit with Jersey Standard.[10]

New York Standard suffered far less loss of status as an institution performing banking functions than either Anglo-American or National Transit. It retained its position as the leading financial agency in foreign trade—in making and receiving payments for transoceanic shipping and shipments, in transferring dividends, and in extending short-term credits. It remained the deposit and loan banker for DAPG until the end of 1911, though not for some others, such as Det Danske, Româno-Americana, and Vacuum Oil foreign units. New York Standard also continued to be the agency for placing funds in the New York money market and for making special loans to Standard Oil employees and friends.

Nevertheless, over the years after 1899 Jersey Standard gradually superseded New York Standard as the leading performer of financial functions within the combination. Into the coffers of the Jersey Company flowed earnings from its own operations, plus dividends from its affiliates, deposits by affiliates and their subsidiaries, and interest on bonds, on book credits, and on other loans. These funds were utilized to pay dividends to stockholders, to expand Jersey Standard's own plant and marketing operations, and to invest in stocks and bonds of affiliated units and outside corporations. Additional funds were lent, chiefly on short term through New York Standard, to affiliates, executives, employees, banks, investment houses, and brokers. It was small wonder that Jersey Standard's net interest income grew from $28,364 in 1899 to $6,580,457 in 1910, and amounted to $6,175,462 during the next year.

Over the years from 1899 to 1911 Jersey Standard's funds for investment purposes built up to impressive proportions. Earnings of the corporation as an operating unit totaled $71,500,000 for the last twelve years of the period, while dividends received from subsidiaries amounted to $758,750,000 for the entire thirteen years. From the total of those two—

$830,250,000—dividends of $519,874,166 were paid to stockholders, leaving a net credit to surplus of $310,375,834. To the sums available to the managers of Jersey Standard's investment program current deposits of a few affiliates were added; on December 31, 1911, these amounted to $18,600,000.[11] Thus, the corporation had at least an easily discernible accumulated aggregate of $328,975,834, which was invested in new plants and securities or in book credits and short-term loans.

The disposition of much of those funds is revealed in the extant accounting papers, though full and comparable detailed data are not available. On June 30, 1911, the trial balance of Jersey Standard's stock-investment ledger showed a total of $359,006,225, which was a gain of $189,854,481 since 1899. Much of that increase was a reflection of expansion in the net book value of the various companies, but Jersey Standard had paid cash for most new acquisitions after the initial exchange of its stock for shares of its nineteen associated companies in the nineties. Considerable capital went into expanding plant and marketing operations of the Jersey Company itself. More explicit information on other investments of Jersey Standard appeared in its balance sheet for December 31, 1911; bonds held totaled $51,261,779. Of that amount, $34,654,322 (67.6 per cent) had been issued by Standard Oil units or closely associated corporations and almost all the remainder by twenty-three American railroads.[12] At the same time, the trial balance of the holding company's current deposits and loans with prevailing and former affiliates set forth twenty-six loans aggregating $53,040,269.

In addition to the classifications of investments already mentioned specifically, funds flowed from Jersey Standard, through New York Standard, to a number of other categories of borrowers. Unfortunately, no complete listing of these credits is available for any date other than that of the reorganization for the dissolution. On December 12, 1911, the total of these loans then transferred to the books of Jersey Standard directly was $53,000,000.[13]

In that sum the two largest categories were the short-term loans to banks and to investment houses and brokers.[14] The latter totaled $22,100,000. In all but one case definite rates of interest, ranging from 3¼ to 3⅜ per cent, were stated. One brokerage house, however, acting as an agent, paid Standard Oil according to the interest it collected on the sums lent and retained but 10 per cent of it for itself.[15] A time limit was placed on all but a few small loans and one large credit callable on demand. It can be assumed that these loans to brokers flowed into the call loan

market. The same might have been true for some of the $10,700,000 placed with banks, largely in New York, in return for deposit certificates with given due dates. These were the loans by Standard Oil companies which excited comment in the hearings by the Pujo Committee in 1912.

Of the several other categories of loans only two were large: these were investments in securities of outside corporations and governments and in loans to three large producers of crude petroleum. The latter totaled $7,700,000 at this time, largely accounted for by the investment in Barnsdall's companies already discussed in an earlier chapter.[16] Bonds and notes of New York State and City, and of three railroads, made up $6,800,000, of which two-thirds was invested in city bonds. Short-term loans to affiliates and some special accounts for officers, apparently for account of Standard Oil companies, totaled another $3,400,000. The remaining $2,-300,000 went to employees and a few other unidentified individuals.

Loans to officers and other employees of the companies for their own use amounted to less than $700,000, if those marked "special account," which were probably for Standard Oil business, are excluded. The practice of lending money to employees to buy Standard Oil stock was continued; the interest charge was 6 per cent per annum, the stock being deposited as collateral. Some loans of smaller amounts were extended to employees with special needs. One trusted junior executive borrowed repeatedly to meet the pressing demands of his wife's long illness; another was assisted in educating his son and in establishing him in business. Regardless of the particular affiliate for which these men worked, the loans were extended by New York Standard.[17]

Obviously, after 1899 Standard Oil continued its well-established policy of self-financing, a noteworthy feature of almost all its history since 1880. Under such circumstances it is not surprising that no financial detail was too small to escape the scrutiny of Standard Oil men and that they sought to apply other financial policies uniformly throughout the organization.

The managers gave increased attention during this period to the method of arranging short-term credits to finance imports of petroleum supplies by European affiliates. In some cases they changed the techniques in order to save on bankers' commissions and to obtain more favorable rates of foreign exchange.[18] In making these alterations in practice, Standard Oil executives had to take into consideration many different local European conditions which can be illustrated by the cases of DAPG and Det Danske.

At the beginning of the century, as in earlier years, European banks fi-

nanced imports of petroleum. To collect payments from affiliates on the Continent, Standard Oil Company of New York drew ninety-day sight bills of exchange on bankers designated by purchasers, attached bills of lading, and negotiated the paper with New York banks. The latter gave a somewhat lower rate of exchange for these documentary bills than they paid currently for clean drafts (those with no bills of lading and other documents attached). The European financial institutions charged ⅜ or ½ per cent for accepting the bills of exchange.[19]

Even before the ownership of DAPG shifted to the United States, the method of collecting for shipments to Germany by drawing ninety-day sight drafts was modified. During the first years of the decade the principal function of the Bremen office of DAPG was handling the company's finances, lending funds when it had a surplus and arranging for short-term credits when necessary, which was usually during the summer and autumn when the imports of petroleum products were heavy. Although DAPG had no difficulty in borrowing, the investment of funds created problems. Because of the information it would give competitors, the managers of the company did not wish to make deposits with banks which themselves were interested in petroleum. Safe borrowers were not always easy to find. James McDonald suggested that DAPG deposit with New York Standard surplus funds to which payment for purchases could be debited later. Since the rate of interest offered by the American company was similar to that available in Germany, DAPG agreed to this method.[20]

This beginning in 1904 resulted in the operation of a running account. To it funds were economically remitted by cable; from it DAPG drew in advance during its seasons of large imports; and interest was debited and credited according to the balance. As the account worked, DAPG was almost steadily in debt on short term. Standard Oil Company of New York was providing credit not only to finance the purchase of products but also to some extent for the increase in DAPG's marketing facilities and fleet. On September 19, 1911, the German company owed $6,662,000 on this account. With plans for expansion of the German company under way, and reorganization for the dissolution pending, the managers of Jersey Standard considered unsatisfactory the policy of almost continuous short-term borrowing of large sums. Jersey Standard, the chief stockholder, arranged to subscribe to a debenture bond issue by DAPG.[21]

In the case of Det Danske, the use of ninety-day sight drafts was not so easily abandoned. When in 1909 the managers of the American holding company were arranging for a greater participation in the Danish corpora-

tion, they evaluated all phases of the relationship. F. D. Asche, while in Denmark discussing details with Christian Holm, suggested that the Danish company remit through either DAPG or Anglo-American, depending on the exchange rates. The treasurer of New York Standard had estimated that, quite apart from the saving on the improved rate of exchange obtainable on cabled remittances over that on documentary bills, Det Danske would save $4,000 a year on bankers' commissions on the basis of the value of purchases in 1908. Christian Holm, however, immediately countered with the argument that the change would take business away from the Copenhagen banks through which earlier negotiations had been handled, even though the credits appear to have been granted by bankers in London and Germany. These Danish financial institutions were most friendly to Det Danske. Holm agreed, on the other hand, to arrange to follow the American's suggestion that drafts drawn for shipments to his firm should be clean bills on which Standard Oil could obtain a more favorable rate of exchange from New York banks than on documentary drafts. There the matter rested for the time.[22]

Meanwhile the rate of interest charged to affiliates on short- and long-term loans and of interest credited on balances were matters of important consideration. The rates naturally depended on the nature of the loan or deposit and the national origin of the funds. They also changed with the conditions of the money markets.

The care taken by New York Standard in considering minority stockholders and other factors is shown by its relations with foreign affiliates. In 1904, apparently when exchange rates were favorable, Italo-Americana made a deposit with Standard Oil to have funds available for payment for future supplies and for dividends to the parent company. New York Standard, finding that it had offered a lower rate of interest than was current in Italy, immediately raised it, and arranged that in future the amount should be agreed on mutually every six months in advance.[23]

New York Standard passed on the knowledge gained from experience with interest on foreign deposits to Jersey Standard when that company was learning to handle the running accounts of foreign European affiliates late in 1911. The matter of interest was particularly important to DAPG, holder in turn of deposits in affiliates where there were numerous minority stockholders and operating in a nation which carefully administered its income-tax laws. "Naturally these Companies [affiliates of DAPG] expect the DAPG to pay them a rate of interest on their credit balances which would approximate the current rates they could obtain from the German

banks," Asche advised the treasurer of Jersey Standard. "If they did not do this, the outside interest in these Companies would, no doubt, take serious exception to placing their funds in the custody of the DAPG." So far as "the DAPG's own funds are concerned," he warned, "the tax inspectors in Germany carefully scrutinize all transactions of this nature and have access to the books of the Company. If they should detect that the DAPG was not getting a fair rate of interest on any of their surplus funds, they would, without doubt, protest at once, as this in turn would affect the amount of tax paid by the DAPG."[24]

Even companies wholly owned by Jersey Standard were jealous of intercompany charges. Standard Oil Company (Indiana), of which all but the qualifying shares of directors were held by Jersey Standard, complained to its parent about the rate of 6 per cent on its debt in 1906. The creditor carefully gave the reasons for the increase in interest, and W. P. Howe, assistant treasurer of Jersey Standard, declared that the parent company had treated Indiana Standard "very liberally."[25] He explained: "During the whole of the last half of 1906 money was very scarce and high, the average call money rate for the six months' period being a trifle over 9%. Under these circumstances, I do not see how any modification in the rate can be made." The 6 per cent rate was generally charged affiliates at that time.

Affiliates were advised to watch their interest account and not to pay for loans from the parent when they had bank balances. By 1908 The Interstate Cooperage Company, which had borrowed from its parent largely during the previous two years to purchase tracts of timber and to build new barrelmaking plants, had accumulated large bank deposits. The manager of this company, 100 per cent owned by Jersey Standard, expressed eagerness to reduce the loan account "as rapidly as possible."[26]

INSURANCE AND DEPRECIATION

Two aspects of financial administration—insurance and depreciation—serve to illustrate the care which Standard Oil executives and their staff of experts took to effect economies and to standardize the methods of accounting. The Standard Oil combination had worked earlier to improve the accounting procedures of the affiliates, but after the reorganization under the holding company in 1899 more strenuous efforts were made to bring about systematic methods of accounting and greater uniformity in practices.

Managers devoted continuous attention to the question of risks encoun-

tered by the property of members of the combination. Special committees were appointed to examine past experience and to make recommendations on certain phases of the subject when conditions surrounding a particular risk changed.

In domestic operations Standard Oil men adhered strictly to their long-established practice of not carrying insurance against fire. Its incidence was taken as a matter of course in spite of new methods of precaution. The size of the organization and the geographic spread of its properties were such as to make the managers willing to have the combination carry such risks without protection from commercial insurance companies and without setting up any specific reserve fund. Annual fire losses for the thirteen years 1899 to 1911, inclusive, ranged from a high of $1,387,700 in 1900 (the fire at Bayonne accounted for $1,194,012) to a low of $138,539 in 1910. The total of Jersey Standard's fire losses in the United States for the thirteen years was about $5,500,000.[27]

Since the companies did not carry reserve funds for fire risks,[28] the savings of the plan were reflected only in the extension of the practice. No statistical evidence now exists to measure premiums saved against losses written off. Yet, shortly after the large Bayonne fire in 1900, the Export Trade Committee was recommending that European affiliates follow the American practice of not insuring either plants or stocks of petroleum because the Standard Oil interests in the United States had "saved a large amount of money by carrying their own insurance."[29]

The men at 26 Broadway gradually succeeded in persuading managers of foreign affiliates to adopt the policy of discontinuing carrying insurance on marketing property. In December, 1899, the Executive Committee approved the recommendation of the Export Trade Committee to advise the cancellation of fire insurance on the property of Anglo-American and of marketing stations in the Far East. That suggestion soon became an operating principle. For a time, however, the members of the Committee preferred that fire risks of Continental companies should be covered by commercial insurance, since the large minority interests were neither willing nor financially prepared to carry their own risks. Several alternatives were considered, but S. C. T. Dodd "vetoed" the idea that the holding company should carry fire insurance for affiliates, on the ground that Jersey Standard lacked such power under its charter. The suggestion of forming a separate English company to insure Continental property was also abandoned. In 1902, however, after a statistical study pointed to high premiums and small losses in Europe, the Export Trade Committee

recommended that the affiliates there carefully consider following American practice of carrying no insurance on plants, stocks of petroleum, and river transport facilities. This advice was followed, with a few modifications, except where minority interests were large in subsidiaries of affiliates. In Holland, managers of the American Petroleum Company dropped fire insurance on plants but continued it on petroleum stocks on which premiums were low. DAPG reduced its coverage but continued insurance on river barges because of the incidence of collision. Beginning in 1905, Italo-Americana followed wholeheartedly the policy advocated and carried no reserve fund for its risks.[30]

A practice of self-insurance was introduced for ocean-going tankers and bulk cargoes. Managers of companies adopted it only gradually and established reserve funds to carry the risk. DAPG began self-insurance of its steamers as early as the summer of 1893, but it continued for a time to carry policies with commercial companies on one large tanker and on all bulk cargoes. In 1902 the Export Trade Committee recommended that Continental affiliates follow Anglo-American's new practice of self-insuring bulk cargoes. Some three years later, affiliates had adopted the policy on all but the largest marine risks, which they covered for total loss only. In an attempt to bring about greater uniformity, the Export Trade Committee recommended that insurance should be carried only on the amount by which a tanker and cargo exceeded $500,000.

The question of marine insurance was reviewed when the conditions of shipping changed. Late in 1905 a special committee (Philip Ruprecht, R. C. Veit, Howard Page, and Walter Teagle) made a complete study of the whole subject. When in 1907 DAPG lost two tankers—the *Minister Maybach,* which "was never heard from any more," and another by stranding—executives of the German company reviewed its practice. Later a growing fleet, increased carriage of naphtha, and trips of tankers through the Gulf of Mexico all introduced new factors which added to risks. The German managers decided to continue the policy of carrying no marine insurance whatsoever with commercial companies but to increase the company's insurance fund.[31]

The record of DAPG illustrates the saving to the combination on marine insurance. The company paid premiums into its reserve fund from which deductions were made for losses and the payment of "gratification" to all officers of steamers which had "run luckily" during a year. Of the 10,569,657 marks paid into the fund from 1894 to 1910, only 4,334,437 marks were paid out for losses and gratuities. With a good marine record

DAPG had accumulated a fund of 2,000,000 marks ($476,000) by 1898, at which figure it was held until the increase was made in 1911; the rest was credited to profit and loss. Self-insurance cost only 41 per cent of the amount commercial insurance would have done.[32]

The policy of depreciation evolved gradually over a period of time and differed considerably among companies. In the 1890's the producing companies in Pennsylvania systematically wrote down their assets 12½ per cent a year, while The Ohio Oil Company used the rate of 15 per cent. Pipeline companies appear not to have been so regular. Marketing corporations received advice on methods of calculating depreciation in the manual which dated from 1884, but it took some time for practices to be standardized. Refining companies appear to have been less consistent in their practices. For example, Ohio Standard showed no writeoff for depreciation after 1885 until 1893. In the latter year Rockefeller suggested that an estimate be made of wear and tear for the eight years. He also recommended that the fact of Cleveland's decline as a refining center should be taken into consideration in deciding on the amount of depreciation.[33]

In addition to the sums written off by the separate companies, the consolidated accounts show a so-called "general depreciation" for each year from 1884 to 1895, inclusive. The total appears to have been an estimate and not to have been computed at any systematic rate based on the amount of the investment or the anticipated life of the property. During the worst years of the depression of the 1890's the total grew larger, accumulating from $29,000,000 on January 1, 1892, to $90,348,187 four years later; the lump sum for the year 1895 was $16,198,302. This amount, deducted from gross earnings to find net earnings, was apportioned among the different constituent companies, but not all companies showed a part of this "general depreciation" and the sums differed from year to year. For example, for Jersey Standard itself the amount was $800,000 for 1893 and $499,858 for 1894.

After 1895 no such lump sum for depreciation was shown on the consolidated accounts. Depreciation thereafter appeared on the individual plant accounts of affiliates and of Jersey Standard as an operating company. In 1899 S. C. T. Dodd gave the average annual depreciation for the properties of the combination as 5.77 per cent.[34]

While many affiliates had had systematic rates for the depreciation of different types of property, modifications were made for specific reasons. One European company reported taking liberal depreciation on a particu-

lar plant because its book value was too high, perhaps because of a high purchase price or a change in the market.[35] Another corporation reported in 1904 that, although it had well-defined rates of depreciation, it had written off less during the previous year both because experience showed that its rates had been too high on some kinds of property and also because, though the year had not been good, the company wished to pay large dividends in order to impress a competitor during pending quota negotiations.[36]

In the years after 1899 several considerations induced Jersey Standard's executives to give renewed attention to depreciation policy. Both the unification under the holding company and the tax rulings of European governments encouraged the interest. The top managers of the combination, desiring to keep in closer touch with all affiliates, wanted accounts to be comparable in order that efficiency of local management could be compared. "We are considering the whole question of Depreciations for our foreign companies," William Donald explained to DAPG in 1905, "having in mind what Depreciations have been made in the past, and what the value of their plant is, and what effect taxation may have upon it, so that in so far as it is practicable for us, we may arrive at a method which bears in its entirety a somewhat similar aspect in all the various branches of our connections."[37] The accountants moved toward the twin goals of establishing depreciation rates conforming to actual life expectancy of various types of property and of attaining uniform practices through the combination.

Top management initiated several moves to execute an improved depreciation policy after 1902. The following year, a special study of bookkeeping methods in refineries resulted in the creation of a new accounting unit, the "manufacturing department" of Jersey Standard, and the abandonment by 1908 of the "analyses of manufacturing business" which had been compiled since the 1880's.[38] The fourth edition of Standard Oil's manual for preparing the Barreling and Marketing Report, published in 1904, gave detailed instructions to marketing companies concerning methods and rates of depreciation, although these were merely refinements of rules given in previous editions.[39] As discussed earlier, in 1904-1905 a committee headed by William Donald investigated the practices of European affiliates and made specific suggestions for changes. In several instances A. H. Brainard, comptroller of Jersey Standard, believed that foreign firms had written off too liberally, not only in comparison with American practice but also in relation to the real value and life expectancy of the prop-

erties.[40] Examples drawn from marketing and marine transportation portray some of the procedures and changes in them.

The marketing companies in the United States followed assiduously the practices recommended by the marketing manual, while those in Europe followed them with numerous modifications. In the United States depreciation was calculated on the basis of the value of the previous year, that is, on original cost less earlier depreciations, while in Europe it was calculated on original cost. Bookkeepers applied the rate of 6 or 7 per cent to buildings. On the other hand, in the United States they charged no depreciation on land or on office buildings situated in cities where property was likely to appreciate. They applied the rate of 12 per cent to tank-wagon equipment, iron barrels, drums, and horses, although, of course, they wrote off a dead horse completely. On cases and cans they depreciated at the rate of 36 per cent per annum. While the bookkeepers of DAPG depreciated every item in plant separately and charged these sums directly to individual stations' profit or loss accounts, American marketing companies had a plant-depreciation account for each corporation as a whole. Depreciation was then charged to a company's profit and loss account, along with loss by fire and some twenty-two other miscellaneous items, although the marketers' manual advised that this heading was "not to be considered a dumping ground for all questionable expenses."[41]

Procedures in depreciating marine property differed considerably from one company to another and were subject to many modifications. While the usual rate charged by affiliates in the United States on tankers and barges was 10 per cent on depreciated value, New York Standard's annual deduction for sailing ships was 5 per cent. In December, 1901, as a result of the "contentions" of the tax administrator, Anglo-American reduced its rate of depreciation on tankers from 7½ per cent to 2½ per cent, which it credited to depreciation account. It continued to credit the extra 5 per cent, on which it paid income tax, on its books to Profit and Loss Reserve account for use in emergencies. Tankers were generally profitable; hence too rapid a depreciation would make the yield appear large in comparison with the book value. Moreover, the latter would appear unrealistically small if occasion came to collect on insurance in the few cases in which it was carried with commercial companies for total loss. In Germany the income-tax law provided that annual depreciation must not exceed the actual deterioration caused by wear and tear, and experience showed that DAPG's writing off was at too rapid a rate. In 1911, therefore, the company modified its rule of 5 per cent annual depreciation on original cost.

The 5 per cent rate was applied until a ship was sixteen years old, at which time the rate was reduced to 2½ per cent. Depreciation charges were to stop when the vessel's book value equaled 10 per cent of its original cost, plus major new construction, such as new boilers; even as scrap a tanker would probably command that price.[42]

Although the work of the various committees had resulted in adjustments and greater uniformity in rates, the depreciation taken by some companies was deemed unsatisfactory in the light of later developments. Therefore, "depreciation restored" appeared on the books from 1906 to 1911, inclusive. This credit, applied almost exclusively to pipeline and natural gas companies, reached an annual high of $28,848,891 in the year 1907. Obviously, the addition of that figure had a marked effect upon reported earnings for that year, as smaller sums did in subsequent years.[43]

The motives for this "restoration" of depreciation on the plant accounts of a number of affiliates are nowhere discussed in the evidence found. It is not known how much such changes were influenced by actual improvements in plants and by the fact that rising prices, especially for iron, made replacement cost higher. Neither is it known what part public curiosity or airing of information in court played in the decision. Had the pipelines, for example, remained in use longer than anticipated, thereby making unrealistic the depreciation rates based upon the transitory character of early producing areas in Pennsylvania? Did earnings and dividends look excessively high measured against undervalued net book value? Some officers of the corporation expressed the belief that "net assets" had not fully represented real value.[44] The introduction of a federal tax on corporations in 1909 undoubtedly served as an added incentive for giving attention to the depreciation policy.

In that same year Standard Oil accountants began to list general depreciation items for a group of twelve companies. The number was expanded in 1911 to thirty-four and included almost all the leading Standard Oil units in the United States; a total of $21,804,637 was deducted in that year.[45] This new departure probably inaugurated the systematic annual depreciation of properties of all functions within the combination. It might have been influenced in part by preparation for dissolution.

Few generalizations on the depreciation policy can be made with accuracy. Given the lack of the possibility of evaluating the properties at this late date, it would be presumptuous to state whether the policy was realistic or not. It is certain that gradually Jersey Standard moved toward the aim stated by Brainard in 1905: "It is desirable, as far as it is practi-

cable, to inaugurate a uniform method of depreciation."[46] Careful attention had been given to the nature of the different properties, and, with modifications for local conditions, the companies within the combination had followed similar, if not identical, practice, especially for marketing and marine properties. Rockefeller, among others, thought that net assets had been understated in the balance sheets,[47] and, beginning in 1906, by taking special depreciation upon the plant of some companies and restoring depreciation on others, an attempt was made to evaluate the properties more realistically.

Perhaps the most important idea to bear in mind is that the figures in the next section on net book value and earnings must be considered in the light of the knowledge that many changes were made in accounting and that figures of earlier and later years and for different functions are not really comparable. The data serve only to give a rough picture of financial results.

EARNINGS AND DIVIDENDS

The fact that both public and legal attacks centered largely on the earnings of the Standard Oil combination places a premium upon a careful weighing of all elements bearing upon the financial results of the operation. That consideration prompted the inclusion of the detailed data presented earlier in the chapter. A comprehensive and relatively accurate evaluation of earnings and dividends depends upon an appreciation of the corporate and functional structure of the combination, not to mention financial procedures and accounting practices. Although the returns for different companies and different functions are not without interest, accounting in an integrated organization permits the shifting of income from one to another and may well show somewhat fictitious figures. Hence, the really significant item was the return for Jersey Standard as a whole.[48]

In comparing the earnings of Standard Oil Company (New Jersey) in 1911 with those of earlier years, many facts must be taken into consideration. Since Jersey Standard became the central holding company in the last half of 1899, its own previous earnings are not comparable with those after this date. Even if the annual earnings of Jersey Standard from 1899 to 1911 are compared with those of the Standard Oil Trust during the 1880's and of the Standard Oil Interests during the period 1892 to 1899, several changes should be noted. The Standard Oil combination had expanded its functions, and, with the oil industry, the nature of its business.

For example, the combination increased its participation in production. The returns on transportation by pipeline were not only on a much larger investment, but the average barrel of petroleum was pumped a greater distance than in preceding years. At the later dates profits were made at all stages from the derrick to the retail outlet on some of the petroleum handled, although not on all, and also on the tanks, barrels, cases, cans, and tankers which carried the products. By-products had been developed. In several cases corporations, especially foreign affiliates, had the greater proportion of their earnings flow through the holding company to stockholders after 1900; some of the minority stockholders in individual companies had exchanged their securities for those of Jersey Standard. Differences in depreciation policy, particularly the sharp changes in 1896, must be weighed in evaluating the accounting results.

For the economist interested in pure profit another consideration comes to mind. From earnings, of course, no deduction was made for interest on invested capital to get "net profit." In fact, included in the income of Jersey Standard was a growing credit item for interest paid by affiliates, an intercompany revenue which was a bookkeeping income from the point of view of the combination. Additional qualifications must be made in attempting to evaluate the growth of profit; not only had the capital invested increased rapidly but interest rates had risen during the years under review.

The earnings of the combination grew over the years. As shown on the books for the years of the Trust, 1882 to 1891, the average was $13,-222,510; for the years of the Standard Oil Interests from 1892 through 1898 (during which the depreciation policy changed so that the figures are not quite comparable), it was $26,983,106; for the years of Standard Oil Company (New Jersey) as the holding company it averaged $79,-123,595. The consolidated accounts for 1899 to 1911 cover the earnings of Jersey Standard as an operating company and its proportion of the earnings of the affiliates.

As shown in Table 49, earnings of the combination rose significantly over the period 1891 to 1911. In the latter year they amounted to $95,-400,000, in comparison with $27,367,000 (before deductions for "general depreciation") in 1891 and $43,357,000 in 1898. The two years for which earnings took sizable jumps, 1907 and 1908, were influenced markedly by the restoration of depreciation written off earlier. Without this and other adjustments, the largest of which was for gains of $8,885,274 on the purchase of stock in 1907 by Standard Oil Company (New Jersey), the

books listed earnings for 1907 and 1908 of $93,500,000 and $81,700,000, respectively. Those figures would have been more in line with the earnings shown in preceding years.

Some interest centers in the proportion contributed by various functions to the total earnings of $1,280,152,000 during the years 1891 to 1911 for which classified earnings are available, but extreme care must be exercised in drawing conclusions from the classified earnings on the books. Some of the companies were themselves integrated or carried on more than one activity, and the division of their earnings among the different functions depended upon interdepartmental charges. The assignment of earnings to corporations carrying on only one function in an integrated organization was itself somewhat arbitrary, since it depended upon intercompany prices. For lack of information on the reasoning that lay behind the data given and of the detailed figures to carry out a reshuffling of them, the classification by the men drawing up the consolidated accounts has been accepted.[49] Actually, managers of particular phases of the business jealousy guarded their own bookkeeping results, as has been noted earlier with reference to charges made by gas companies to producing and refining interests and in the matter of interest charges on intercompany loans.

However, certain functions were more favorably situated for earnings than others. The refiners within the combination were definitely in the middle. Had depreciation been charged off on a different basis, results shown for refineries for the years 1896 to 1908 would have been even less satisfactory than they were. The accounting was in line with frequently made statements which indicated that Standard Oil executives thought of producing and pipeline interests as much more risky and shorter-lived than refineries.

Table 49 shows that the largest item within the $1,280,152,000 was $532,-454,000 for transportation. This figure included earnings from pipelines, tank cars, and tankers owned in the United States. Many factors accounted for sizable earnings in the pipelines. Inasmuch as more petroleum moved through the pipelines than Jersey Standard and its affiliates handled at any other level of the industry, the result was not surprising. The investment in this function was at least a third of Standard Oil's total. In some areas the combination enjoyed a monopoly, although this was less marked after 1900 than before; by 1906 its monopoly was strongly challenged in the Mid-Continent and it was nonexistent in Texas and California. Standard Oil appears to have maintained a higher degree of

Table 49 EARNINGS OF THE STANDARD OIL COMBINATION,[a] 1891-1911, CLASSIFIED BY FUNCTIONS

In thousands of dollars

Year	Natural Gas[b]	Producing	Transportation[c]	Crude Oil Purchasing & Carrying	Manufacturing	Marketing Domestic	Marketing Foreign[d]	Miscellaneous	Total[a]
1891		761	18,090	(2,431)*	7,377	2,748	756	66	27,367
1892		(685)	18,666	(2,778)	4,510	2,616	1,158	(134)	23,353
1893		2,306	20,472	(4,838)	2,288	2,965	679	1,352	25,224
1894		3,431	21,357	(7,989)	(1,148)	3,620	986	286	20,543
1895		6,078	19,987	(4,170)	7,756	6,918	1,623	1,585	39,777
1896		4,943	22,526	(10,515)	6,522	6,098	1,670	2,833	34,077
1897		2,620	24,330	(5,751)	3,296	7,164	4,784	1,231	37,674
1898		2,404	26,106	(691)	2,726	6,864	3,903	2,045	43,357
1899		5,853	26,572	(2,514)	16,440	10,435	5,658	2,013	64,457
1900		7,211	24,286	(11,779)	19,601	10,229	2,925	3,041	55,514[e]
1901		959	26,814	(7,873)	16,376	11,667	4,730	(368)	52,305[e]
1902		4,782	27,219	(6,895)	20,274	15,117	4,099	34	64,630[e]
1903		7,698	24,967	(1,437)	27,552	16,971	4,743	862	81,356[e]
1904	250	3,284	25,806	(8,118)	22,721	14,232	2,292	1,118	61,585[e]
1905	335	2,867	23,372	(5,120)	17,017	13,596	3,208	2,198	57,473[e]
1906	2,282	4,029	26,848	1,621	22,697	13,691	7,658	4,312	83,138[e]

Table 49 (Continued)

Year	Natural Gas[b]	Producing	Transportation[c]	Crude Oil Purchasing & Carrying	Manufacturing	Marketing Domestic	Marketing Foreign[d]	Miscellaneous	Total[a]
1907	3,022	9,974	52,301	263	28,286	14,071	10,504	12,870	131,291[e]
1908	11,564	31,909	24,003	(492)	20,761	13,517	9,683	5,515	116,460[e]
1909	5,886	17,104	21,598	(2,325)	7,455	13,730	8,134	5,843	77,425[e]
1910	6,475	23,781	20,128	(1,124)	9,188	13,950	7,355	7,967	87,720[e]
1911	5,193	28,329	37,006	(302)	(2,661)	12,774	7,442	7,645	95,426[e]
Total	35,007	169,638	532,454	(85,258)	259,034	212,973	93,990	62,314	1,280,152
Per Cent	2.7	13.3	41.6	(6.6)	20.2	16.6	7.3	4.9	100

* Figures in parentheses represent losses.
[a] In 1891 the figures are for the Standard Oil Trust, from 1892 to 1898 they are for the Standard Oil Interests, and from 1899 to 1911 they are for Standard Oil Co. (New Jersey) including income from affiliates.

From 1891 through 1895 deductions for "general depreciation" and special pipeline depreciation were made from gross earnings to get net earnings. Hence, the latter were calculated to be $15,151,327 for 1891, $15,449,007 for 1892, $15,457,354 for 1893, $15,544,326 for 1894, and $24,078,077 for 1895. The Consolidated Accounts do not show such deductions after that date. This must be taken into account when comparing the net earnings for 1895, $24,078,077, with those for 1896 of $34,077,519 as shown in *U.S.* v. *SONJ*, XXI, 90. The figures there have been "corrected" slightly to show for 1891 and 1893 $16,331,826 and $19,174,878, respectively, rather than the $15,151,327 and $15,449,007 taken from the accounts for this paragraph.

[b] Earnings from natural gas were included in production until 1904.
[c] Transportation does not include tankers owned in foreign countries.
[d] This does not include operations in Canada and Mexico, which were included in "Domestic Trade." It does include foreign production, which is a relatively small amount, and profit on tankers, which for some affiliates was an important item. For example, in 1910, of Anglo-American's own profits, returns from tankers after deducting losses on sailing ships accounted for 42%.
[e] From this total was deducted each year from 1900 to 1911 an amount for dividends on directors' shares. This total never exceeded $19,000 a year. It is not taken out here, as it cannot be apportioned among functions.

Source: SONJ, Consol. Accts. of S. O. Trust, 1891, of S. O. Interests, 1892-1899, and of SONJ, 1899-1911; *U.S.* v. *SONJ*, XXI, 90.

ingenuity and efficiency in this field than some of its competitors, at least in the opinion of the prideful pipeline men, who often made belittling remarks to Daniel O'Day about methods of inexperienced competitors. The pipeline interests enjoyed strong financial support, possessed multiple experience over a wide area, and were aided by an *esprit de corps* among managers of different ranks, which, although undoubtedly not unique, appears to have been a factor in the dramatic success in driving pipelines into many new fields. With knowledge of the ephemeral existence of the early Pennsylvania fields, managers of Standard Oil thought of the life expectancy of a pipeline as short, and believed that returns must be large in order to reclaim capital invested in a relatively short time. This idea died hard.

Some comments have already been made on returns from marketing, which appeared on the books as the next most profitable function and totaled some $306,963,000 for the twenty-one years. The reader's attention is again called to the lack of growth shown in earnings from domestic marketing after 1902, in spite of largely increased volume of business arising from rapidly expanding sales of gasoline and industrial fuel oil and increased emphasis on marketing by-products.

During these years the foreign market not only contributed directly a smaller total to earnings than the domestic market—$93,990,000 as compared with $212,973,000—but appears to have been a smaller earner per unit. In part this is explained by the fact that in several foreign affiliates sizable minority interests throughout most of the period received part of the earnings from marketing abroad. More intensive competition in foreign countries also had an effect on selling prices. Though about 60 per cent of the kerosene was sold for export, it is not possible to compare the earnings per unit accurately, for probably the higher-priced products—lubricants, waxes, and gasoline—found their largest market in the United States, and some earnings abroad came from sales of an undetermined amount of foreign petroleum products and from miscellaneous functions. If a careful analysis of expenses could be made to separate tanker earnings from the actual foreign marketing function, the total would be appreciably reduced.

Yet the importance of the export trade to Standard Oil cannot be measured by these financial results of marketing alone. Quite apart from the combination's need for an export market for surplus kerosene, especially of certain grades, refining profits were made on all the products exported and on all of them net earnings from pipage were garnered, while a part

of the increasing volume of the crude oil consumed by refineries was produced by Jersey Standard's own affiliates.

The third largest item among classified earnings was that from manufacturing, which accounted for about a fifth of the entire amount. The total for the twenty-one years, $259,034,000, included not only refining and paraffin works but also the manufacture of barrels and glue. Annual earnings under this heading varied more than any other, since they were affected by loss through fires and changes in depreciation policy. Noteworthy is the fact that in spite of the tremenduous increase in throughput and important changes in methods, the growth in earnings from this function was not dramatic. The marked drop after 1908 is attributable to the application of the new general depreciation to manufacturing companies.

The Jersey Standard combination remained relatively more important as a transporter, refiner, and marketer than it was as a producer of crude oil, yet its returns from this function, $169,638,000 for twenty-one years, were not negligible. It was not until 1908 that the combination's vastly increased investments in producing properties began to bear fruit. Earnings had averaged somewhat under $5,200,000 per year for the previous nine years, but they then appeared as sizable (although fluctuating) items which reached a high of $31,909,000 in 1908. When it is recalled that Standard Oil became a producer for the first time in the late 1880's, its growing interests in most important fields in the United States and some in foreign countries were noteworthy.

Natural gas interests continued to be a minor part of Standard Oil's functions and were indeed an offshoot of producing crude oil. Almost all the earnings listed under natural gas in Table 49 were reinvested in the gas companies themselves.

A heading under the title of "crude purchasing and carrying" always appeared on the books—on those of New York Standard through 1905 and on those of the parent company for the remainder of the period. The account embraced only operations in Lima-Indiana and Appalachian crudes, however, and had no connection with Illinois, Mid-Continent, Texas, or California crude purchasing activities. Ohio Standard bought its own crude, but Jersey Standard's account in the name of P. S. Trainor included all other oil purchased, carried, and sold to refineries of the combination which utilized grades of petroleum produced in the two Eastern regions. Since the system of posted price, discussed earlier, gave sellers the right to select a market price within a stated interval after delivery to the pipeline, and since refineries paid the price as of the day of their order,

it was natural that sellers chose days of relatively high prices and buyers chose those when prices were relatively low. The crude oil purchasing account showed in red for all but two years of the period.

The "miscellaneous" category of earnings included a motley array of items. The total of $62,314,000 for the period under review had been kept that low by a number of entries, habitually in red, on the books of New York Standard and the Jersey Company. These included such items as the "General Accounts" and "S. H. Paine Adjustment," presumably representing services performed for the combination as a whole. By 1911 the largest single plus item was interest received by Jersey Standard. In part this came from outside the combination, but it also included numerous intercompany transfers, which were payments to the holding company for the use of capital on short and long term. Earnings on "Asiatic Naphtha Purchasing," those on auxiliary manufactures, such as that of the Gilbert & Barker Manufacturing Company, and dividends from the Tide Water companies also appeared under the "miscellaneous" classification. Obviously it was well named.

The vastly extended properties were owned, and the dividends received, by 6,066 stockholders in 1910. Though members of five old Standard Oil families (Rockefeller, Harkness, Payne, Pratt, and Rogers) held almost half the outstanding stock of the parent company, the list of stockholders had grown from 3,500 in 1899.[50] The relation of the owners of the majority of the stock to management is discussed in Chapter 11.

Net value rose spectacularly on the books of Jersey Standard from 1899 through 1911. The term net value (net worth) was used by Standard Oil's accountants to refer to the sum of capital stock and surplus or the excess of assets over total liabilities. Jersey Standard's net book value increased from $196,713,318 in 1899 to $615,956,056 in 1910. This expansion reflected the investment of about half of the annual earnings in producing properties, pipelines, new refineries, and expanded marketing facilities over the thirteen years.

Standard Oil's policy was to plow back profits, and the ratio of dividends to earnings was lower after 1899 than earlier. The average of dividends for the ten years from 1882 through 1891 was $7,912,700 a year, which was 58.1 per cent of net earnings. In addition, a 20 per cent stock dividend, amounting to $15,028,760, was paid in May, 1887, and, during the next year, $3,497,000 in certificates of the Natural Gas Trust were distributed to stockholders of the Standard Oil Trust.[51] For the seven years of the Standard Oil Interests the figures, not completely comparable,

were an average dividend of $20,853,910, which was 77.0 per cent of the earnings. From 1899 to 1911 dividend payments varied comparatively little except for a few years immediately after 1899. (See Table 50.) For several years they were $40 a share, averaging a total each year of $39,-990,320; this was 50.5 per cent of earnings.

Table 50 CAPITAL STOCK, NET VALUE, EARNINGS, AND DIVIDENDS OF STANDARD OIL COMPANY (NEW JERSEY), 1899-1911

	Capital Stock at End of Year	Net Value[a] at End of Year	Earnings	Dividends Paid: Dollars per Share	Dividends Paid: Amount[b]
1899	$97,250,000[c]	$196,713,318	$ 64,456,674	33	$32,092,500
1900	97,448,700	205,480,449	55,501,775	48	46,691,474
1901	97,448,900	210,997,006	52,291,768	48	46,775,390
1902	97,448,900	231,758,406	64,613,365	45	43,851,966
1903	97,448,900	270,217,922	81,336,994	44	42,877,478
1904	98,338,300	297,489,225	61,570,111	36	35,188,266
1905	98,338,300	315,613,262	57,459,356	40	39,335,320
1906	98,338,300	359,400,193	83,122,251	40	39,335,320
1907	98,338,300	451,432,799	131,274,808	40	39,335,320
1908	98,338,300	526,538,701	116,445,910	40	39,335,320
1909	98,338,300	568,727,055	77,413,508	40	39,335,320
1910	98,338,300	615,956,056	87,705,976	40	39,335,320
1911	98,338,300	660,451,800	95,414,239	37	36,385,171
Average	97,980,908	377,752,015	79,123,595		39,990,320

[a] The net book value equals the amount shown on the books for the sum of capital stock and surplus or the excess of assets over total liabilities.

[b] The amount for 1899 was that paid to Standard Oil investors by the twenty companies throughout the year of reorganization. Since dividends continued to be paid on a few outstanding Standard Oil Trust certificates through 1904, total dividends paid to Standard Oil investors exceeded slightly those paid by Jersey Standard. Total payments for 1900 and 1901 were $46,800,000 each, for 1902 were $43,875,000, for 1903 were $42,877,516, and for 1904 were $35,401,788.

Total dividends paid by Standard Oil Co. (New Jersey) on preferred stock amounted to $8,068.50 in 1899, $70.50 in 1900, and $6.00 for each of the years 1901-1904, inclusive, all of which are embraced in the above data.

Jersey Standard's own dividend payments in 1899 totaled $14,304,188.50.

[c] Calculated capitalization of Standard Oil Interests.

Source: SONJ, Consol. Accts., 1899-1911.

Impressions of the financial results depend on the base with which the earnings and dividends are compared. The capitalization of the Trust in 1882 was $70,000,000. During the years 1892 to 1898 the outstanding stocks of the Standard Oil Interests varied little and averaged $99,014,996. For dividend purposes the outstanding stock of Jersey Standard was calculated at the end of 1899 at $97,250,000 and rose little during the years through 1911. It averaged $97,980,908 for the period. This was all the stock. The holding company had no outstanding preferred stock after 1900 and no bond issues. Hence, earnings and dividends appear remark-

able when compared with par value of capital stock. For the thirteen years, 1899 through 1911, dividends averaged annually 40.8 per cent of capital stock, but almost 50 per cent of earnings was put back into the business each year with little change of capitalization. For the thirteen years dividends averaged 10.6 per cent of net value.

The year 1906, the last one before the depreciation adjustments made single annual figures less representative of the period as a whole, can be considered in more detail. Earnings that year were 84.5 per cent on capital stock and 23.1 per cent of net book value, the percentage being somewhat higher than the average of 20.9 for the thirteen years. For 1906 dividends were 40 per cent of capital stock and 10.9 per cent of net value. A dividend of $40 per share was a magnificent return on par value of $100; but the yield for an investor who had bought at the low market price for the year ($512) was but 7.8 per cent, while for him who had bought at the high ($698) it was but 5.7 per cent.[52]

Were the earnings of the combination too high? In his *Report on the Petroleum Industry*, Part II, *Prices and Profits*, the Commissioner of Corporations answered the question in the affirmative. "The profits of the Standard Oil Company, particularly on its domestic business," he declared, "are altogether excessive, and they have been higher during recent years than formerly."[53]

Of such a bald statement Standard Oil men privately expressed quite different opinions. Among others, W. H. Libby contended that critics confused high market value of shares and a high rate of dividends on the par value of capital stock with high profits. He pointed out that common stock of Jersey Standard was especially favorably viewed by investors because no bonds or preferred stock existed to have prior claims and because the capitalization of the holding company had not been increased to correspond with reinvested profits and actual appreciation of assets. If dividends were compared with "intrinsic assets" and annual volume of business, said Libby, they were "reasonably large" but "not excessive."[54]

John D. Rockefeller, an investor in a diversity of industrial enterprises, considered the earnings and dividends of Standard Oil good but not out of line with other large enterprises in the United States. "I am surprised to find the average dividends for twenty-five years 13.86 per cent," he commented on H. C. Folger's statistical analysis of the years 1882 through 1906.[55] "Business men will not regard the earnings for a period of twenty-five years which you present as excessive," Rockefeller added. In fact, he expressed himself in favor of giving the public full information about the

total earnings of Standard Oil, "naming all the sources, without indicating the profits of each source," in the belief that these facts would impress both the public and the courts favorably.[56] In a later letter he pointed out that competitors had charged the same prices as Standard Oil and remarked that the profits derived from the oil business were not larger "than those from many other large businesses with less risk, including the United States Steel Company, *and not as large as many others.*"[57]

With reference to prices and profit margins, extant data seem to be of limited value. The best available are those published in the Garfield report on prices and profits in the petroleum industry. The price series there indicate that Standard Oil margins between the purchase price of crude oil and the selling price of petroleum products narrowed during the years between the early 1880's and the mid-nineties and widened thereafter, but the analysis of the reasons for the changes is not so comprehensive as it should be. Furthermore, the data presented are uneven in quantity and quality even for the period covered—from 1882 to 1905. In short, a satisfactory analysis of prices for the petroleum industry to 1911 awaits the collection and compilation of more revealing statistics and a more careful interpretation of them than has yet been made.

In evaluating the reported earnings, it cannot be ignored that the Jersey Standard family engaged in a remarkably wide range of operations. It participated in every phase of the petroleum industry from drilling to international marketing, plus several auxiliary manufacturing enterprises, real estate, brokerage, insurance, foreign exchange, and banking, not to mention the operation of barges, sailing ships, tankers, and tank cars. Those "ramifications of profits,"[58] to use Rockefeller's phrase, must be considered in weighing earnings and dividends.

Several additional factors also enter the picture. Earnings could not but show some reaction to the continuous reinvestment of profits year after year and to the increased volume of business. In the latter connection, the impact of the automotive vehicle must be evaluated; Standard Oil men were in a position to reap the full benefit of the increasing demand for gasoline, even though they had had nothing to do with either the invention or the commercial development of automobiles and trucks. At the same time, the rise in the general price level and in interest rates after 1897 constituted significant elements in the picture of earnings. "I shall be surprised if the results show that the Standard increased its net profits proportionately to the increase of the interest on money,"[59] wrote John D. Rockefeller in 1909. As already explained, interest paid by affiliates and

Table 51 CONSOLIDATED BALANCE SHEET OF THE STANDARD OIL COMBINATION, 1882-1911

In millions of dollars

	Plant	Other Investments	Accounts Receivable	Merchandise	Cash	Gross Assets	Accounts Payable	Net Value of Standard Oil Combination	Capital Stock	Net Surplus	Net Book Value of Standard Oil Combination
1882	44.2	1.6	26.6	10.9	0.7	84.0	23.0	65.3[a]	71.1	(5.8)*	65.3
1883	48.2	3.4	32.5	10.6	2.1	96.8	32.4	72.8[a]	71.7	1.1	72.8
1884	45.4[b]	7.1	29.1	16.7	0.7	99.0	32.2	75.9[a]	71.2	4.7	75.9
1885	39.5[b]	9.7	29.7	26.0	0.9	105.8	41.5	76.7[a]	71.2	5.5	76.7
1886	45.3	7.8	38.3	18.9	0.8	111.1	42.5	87.0[a]	73.3	13.7	87.0
1887	46.1[b]	6.5	50.3	23.7	1.0	127.6	51.1	94.4[a]	90.2	4.2	94.4
1888	44.6[b]	6.6	58.2	23.4	1.4	134.2	50.7	97.0[a]	90.3	6.7	97.0
1889	52.2[b]	7.2	62.1	24.9	1.5	147.9	56.1	101.3[a]	90.3	11.0	101.3
1890	69.9[b]	10.9	80.4	27.4	1.5	190.1	77.0	115.8[a]	96.9	18.9	115.8
1891	76.5[b]	7.7	83.4	29.2	1.5	198.3	76.5	120.8[a]	97.2	23.6	120.8
1892	70.0	10.4	99.4	32.2	1.9	213.9	85.8	128.1	99.8	28.3	128.1
1893	69.3	10.2	110.3	36.7	2.5	229.0	97.1	131.9	99.8	32.1	131.9
1894	68.0	12.8	111.2	39.5	2.0	233.5	97.7	135.8	99.8	36.0	135.8
1895	64.0	14.4	115.1	50.4	3.5	247.4	104.1	143.3	98.5	44.8	143.3
1896	69.2	16.3	98.4	52.6	2.2	238.7	91.5	147.2	98.5	48.7	147.2
1897	77.8	15.5	102.5	47.1	2.2	245.1	92.3	152.8	98.5	54.3	152.8
1898	83.6	19.4	85.2	56.9	11.2	256.3	92.1	164.2	98.5	65.7	164.2
1899	83.5	21.7	95.2	70.4	24.0	294.8	98.1	196.7	97.3	99.4	196.7
1900	91.3	21.1	95.8	69.4	21.9	299.5	94.0	205.5	97.5	108.0	205.5
1901	98.1	21.6	113.8	73.2	15.0	321.7	110.7	211.0	97.5	113.5	211.0
1902	117.7	20.8	130.3	73.5	15.7	358.0	126.2	231.8	97.5	134.3	231.8

Table 51 (Continued)

	Plant	Other Investments	Accounts Receivable	Merchandise	Cash	Gross Assets	Accounts Payable	Net Value of Standard Oil Combination	Capital Stock	Net Surplus	Net Book Value of Standard Oil Combination
1903	143.1	22.6	131.1	89.8	15.3	401.9	131.7	270.2	97.5	172.7	270.2
1904	156.4	29.4	166.1	97.0	18.6	467.5	170.0	297.5	98.3	199.2	297.5
1905	158.6	36.8	201.5	95.1	18.4	510.4	194.8	315.6	98.3	217.3	315.6
1906	177.8	42.3	209.4	96.0	13.2	538.7	179.3	359.4	98.3	261.1	359.4
1907	227.3	53:7	230.6	113.6	8.1	633.3	181.9	451.4	98.3	353.1	451.4
1908	285.2	45.3	225.8	151.6	10.0	717.9	191.4	526.5	98.3	428.2	526.5
1909	303.2	56.3	276.3	154.6	10.0	800.4	231.7	568.7	98.3	470.4	568.7
1910	339.2	75.9	266.9	161.3	9.2	852.5	236.6	615.9	98.3	517.6	615.9
1911	363.4	79.4	234.8	168.0	14.8	860.4	200.0	660.4	98.3	562.1	660.4

* Parentheses indicate a minus quantity.

[a] For the years 1882 through 1891 these figures include not only the proportion of the net value of the companies held by Standard Oil investors but also the net assets of the Standard Oil Trust per se. For the ten years the figures for the last named were in millions respectively: \$4.3, \$8.4, \$9.1, \$12.4, \$18.4, \$17.9, \$13.5, \$9.5, \$2.7, and minus \$1.

[b] In this table "general depreciation" has been deducted from plant account, not from net value as done by Standard Oil accountants for these years; hence these figures differ from those in the Consolidated Accounts.

Source: SONJ, Consol. Accts. of S. O. Trust, 1882-1891, of S. O. Interests, 1892-1898, and of SONJ, 1899-1911.

other borrowers to the parent appears in the earnings reported. There appears to have been no deduction in costs for interest on capital invested in order to ascertain net profit, as had been done in at least some early accounts. Rockefeller also put his finger on another point: even though the book assets probably did not fully represent "real value," the great increase in net book value would have justified Standard Oil managers, in his estimation, in issuing stock in reappraisal each year.[60] In fact, if they wanted capital stock to reflect a relatively accurate picture of investment, the capitalization of Jersey Standard should have stood much higher than it was in 1911. After studying Table 51, the reader may draw his own conclusions.

In the course of the years 1899-1911 Standard Oil managers labored hard to bring greater reality and uniformity into their financial operations and reports. They rearranged their corporate holding-company structure in such a way as to bring almost all important corporations directly under the wing of Jersey Standard. They sought to reduce costs by extending the practice of self-insurance to foreign operations and by effecting savings through the elimination of banking and other middlemen. While attempting to develop a more consistent, uniform, and realistic policy of depreciating plant and equipment, they made many major adjustments in their accounting. The accounts showed relatively high earnings, but the evidence indicated that, while dividends were a matter of fact, earnings were a matter of opinion. A considerable proportion of profits was reinvested, thus providing funds for plant facilities, such as pipelines and refineries, and for the rapid expansion of the industry. The failure of the managers to adjust the capitalization of Standard Oil Company (New Jersey) in conformity to net assets appears to have been a major error; to show enormous earnings and 40 per cent dividends on $98,388,300 created a false impression in the popular and governmental minds. But that fact merely points up the weakness of Standard Oil men in their public relations, the subject of the next chapter.

Chapter 22

Criticism and Reactions, 1893–1903

While carrying on their world-wide business operations Standard Oil men fought a running battle to maintain the reputation and position of the Jersey Standard family. Public opposition to large aggregations of capital in general, and to Standard Oil in particular, rose swiftly after 1893. Newspapers, magazines, pamphlets, books, governmental investigations, and litigation reflected and communicated an antitrust sentiment which was founded on a compound of fact and fancy, truth and falsehood. Unco-ordinated in the beginning, by 1904 the major allegations were incorporated into a book which focused the attention of the public upon the evil doings with which the giant oil combination was charged. As the chorus of condemnation grew louder and stronger, Standard Oil executives had to decide whether to pursue the policy of relative silence instituted in the 1870's or to adopt a more aggressive program in handling Standard Oil's relations with the public.

THE LEGAL DEPARTMENT AND ITS PERSONNEL

The Legal Department yielded primacy to no other part of the Standard Oil entity in upholding the legal rights and public reputation of the combination. For that reason, an understanding of the organization, functions, and policies of that department is basic to a comprehension of the strategy and tactics of the Standard Oil Company (New Jersey) in its public and legal relations.[1]

S. C. T. Dodd continued until 1905, as he had done since 1881, to play a dominant role in the legal affairs of Standard Oil. Executives consulted him on matters large and small. He gave his opinion with a fearless disregard of the methods and desires of top management. His concern lay not only with legal interpretations but also with broad aspects of the company's position. In giving advice he often supplemented legal reasons with references to moral obligations and to the best public interests of the company. He believed wholeheartedly in the organization for which he

worked, and, wishing to keep a certain professional disinterest, he refused a loan to enable him to buy stock in the company which he served.[2]

Dodd's confidential letters agreed completely with statements of his philosophy in his published articles and speeches. He believed implicitly in the advantages which size, integration, and skilled management gave to production and distribution, and he had no hesitancy in defending large corporations. On the other hand, he did not consider that all organizations of businessmen were necessarily above reproach. For example, he cautioned Standard Oil executives to delay in joining the National Association of Manufacturers until they were sure that its officers were "possessed of the necessary wisdom for conducting such an organization properly."[3]

As might be expected, Dodd went no further than his era in a number of matters. Although he advised a liberal policy toward workmen's compensation and a broad interpretation of the pension plans, he apparently did nothing to forward Gunton's desire in 1903 to confer with the managers on employees' representation and unionism. Dodd attempted to keep his company within the law, as he saw it, and in the good graces of public opinion.

Mortimer F. Elliott was a worthy successor to Dodd. Although he did not become general counsel of Standard Oil Company (New Jersey) until January, 1905, he had joined the staff in New York in 1898 and had done legal work for the affiliates in Pennsylvania even before that time. Experienced as a member of a law firm in Wellsboro, Pennsylvania, he was well acquainted with the Oil Regions and its men. He had been counsel for railroads, had argued several cases before the Supreme Court of the United States, and had served in Congress for a year. Elliott's respect for Daniel O'Day, whose friendship influenced him to go to work for Standard Oil, indicated his appreciation of men very different from himself. A plump, mustached widower, Elliott resided in a hotel in downtown Manhattan, indulged his penchant for expensive clothes, and lived a life of almost complete devotion to the multitudinous functions of the Legal Department of Standard Oil.[4]

In spite of a heavy burden of work, the Legal Department of Standard Oil Company (New Jersey) itself remained very small. During the first years of the century Dodd and Elliott, assisted by one secretary, ran it alone, but the addition of Lee W. Dodd, son of S. C. T., had raised the number of lawyers to three by 1902. By 1906 Martin Carey had joined the staff. The following year, on S. C. T. Dodd's death and Lee Dodd's

resignation, the engaging of Chester O. Swain brought the number of lawyers back to three, and two stenographers handled the voluminous correspondence.[5]

Under the general supervision of the lawyers at 26 Broadway were several echelons of legal talent in the field. For example, one counsel served affiliated pipeline companies in Pennsylvania, another the Eastern natural gas companies.[6] A. B. Fleming watched over all Standard Oil's legal and political affairs in West Virginia, Virgil P. Kline was concerned with these interests of the combination in Ohio, and A. D. Eddy of Chicago held a similar position for eleven Midwestern states. These three lawyers were paid regular salaries and devoted full time to Standard Oil problems, although they maintained their own legal firms. Numerous other local attorneys were engaged for special tasks. They prepared agreements, examined titles, gave advice and argued cases dealing with leases, rentals, and wages and other issues raised by workmen. Jersey Standard and its affiliates engaged the services of these local attorneys for two reasons: on occasion many small legal affairs were pending in cities so distant from one another that the regular staffs could not handle all the cases; and, as an attorney remarked, "It is absolutely necessary to have local counsel in the trial of cases which go to a jury."[7] Elliott, who exercised the same care over expenditures that Dodd had done, refused to put any of these men on a regular salary or to give any special remuneration in response to pleas that by taking Standard Oil's business a lawyer damaged his general practice. In selecting local lawyers Elliott preferred a man not in political life. "A lawyer in politics is not a very valuable legal adviser as a rule," he commented.[8]

Immediately upon his arrival at the New York office Elliott began to perform both legal and administrative services. He personally drew up briefs for important cases and assisted in trying the outstanding ones (for example, the Ohio cases of 1897-1900) until the onerous work of the years following 1905 necessitated engaging more outside help. In 1898 he put into operation a new policy of co-ordinating the legal work of the combination; this brought information from all the affiliates to Elliott's desk. Occasional lack of adherence to this policy was for several years an irritant to the efficient counsel. No less a person than C. E. Bedford engaged a law firm to bring a suit for an affiliate without consulting Elliott. Possessed of an extensive knowledge of petroleum law and a general view of the combination's business, Elliott not only gave expert advice but also

evaluated the possible outcome of cases in relation to the general interest of Standard Oil.[9]

Quite apart from handling current litigation, the department performed the function of keeping well informed on public opinion, projected legislation, and new enactments. A vast volume of correspondence flowed to Elliott's desk from Standard Oil employees, attorneys, and newspapermen. Beginning late in 1900, the office received the N. & D. Special Washington News Service and later subscribed to two similar agencies.[10] From 1906 the Law Reporting System sent advance data and progress information from all states of the Union on bills of interest to Standard Oil.

When a publicity man, enjoying the euphonious name of Joseph Ignatius Constantine Clarke, was added to the staff of Standard Oil in 1906, he was attached to the Legal Department. Clarke brought a new type of ability to its work. This warmhearted Irishman had had diverse experience, ranging from participation in the Fenian movement in the 1860's to being Sunday editor of the *New York Herald* from 1903 to 1906. Playwright and poet, he had held editorial positions with the *Morning Journal* and the literary weekly, *Criterion*, and had served as reporter, dramatic critic, and music, literary, and sports editor of the *New York Herald*.[11] Clarke was a man of ardent beliefs and dramatic propensities. Elliott and others familiar with Standard Oil's history had to exercise some censorship to keep his effusive statements to the press in strict line with accuracy. Clarke joined the company's staff at a time when the newspapers sought information as never before. His quick responsiveness and close relation to Archbold were responsible in part for the increased flow of literature from 26 Broadway.

The Legal Department, more than any other, devoted attention to functions which today would be considered the work of a public relations department. Other individuals, however, both within Standard Oil and outside it, participated in stating its case; their efforts will be considered in later sections.

ATTACKS AND ALLEGATIONS, 1893-1903

That the executives and Legal Department of Standard Oil needed to give greater attention to public relations was amply evident by the early years of the twentieth century. Prior to 1893 many accusations had been made, but they were scattered and unco-ordinated. By 1903 most of the allegations had been aired and reiterated in courts, investigations, newspapers, and periodicals. A polemicist, a crusading politician, spokesmen

for small business, competitors from the Appalachian and Lima-Indiana regions, and the sensational press all added new fuel to the public fire under the corporate family headed by Jersey Standard. Standard Oil units were haled into court on antitrust charges in Ohio and Texas. Distilling and digesting the diverse data, one of the more famous journalists of the time then pointed up all the charges against the giant business in a series of magazine articles which focused the eyes of a world audience upon the policies and practices of Rockefeller and Archbold and their associates.

Henry Demarest Lloyd's *Wealth against Commonwealth,* published in 1894, set the example for extremists among the critics of concentrated economic power, particularly of the Standard Oil combination. Fundamentally, his book amounted to an elaboration of the thesis advanced in his article in *The Atlantic Monthly* in 1881, illustrated by data drawn from governmental investigations and court cases during the intervening thirteen years. After briefly mentioning combinations engaged in coal mining, railroading, meat packing, flour milling, and whisky manufacture, he devoted almost all his attention to the evils of the oil trust. According to Lloyd, through the South Improvement Company the Standard Oil group "snatched away" from the "men of the oil country" the "ripe fruit" of their "wonderful development" of the industry during the 1860's. Readers were left with the impression that Standard Oil men created the Improvement Company and then continued the scheme to gain control of the petroleum business, though they "were not the first in any department."

The author accepted every allegation adverse to the reputation of Standard Oil. He was convinced that rebates and drawbacks were the foundation of its strength both before and after 1887, that it had killed off competitors by ruthless localized price cutting, and that it had been inhumanly unjust to innumerable small folk, including two widows. Lloyd took all George Rice's accusations at their face value and saw nothing but truth in the charges of Lewis Emery, Jr., identifying Standard Oil with all the troubles which that millionaire had encountered in producing, refining, and piping petroleum. Lloyd believed that the oil Trust was responsible for the election of H. B. Payne as Senator from Ohio and that justice had suffered eclipse in the Buffalo Lubricating Oil Company case.

Lloyd accepted none of the evidence presented by Standard Oil executives in any case or any of their statements of fact and policy. He could give them credit for nothing except ruthless exploitation of their competitors and of the consumers of the United States. "They did not even invent the rebate," said Lloyd. "They made oil poor and scarce and

dear."[12] *Wealth against Commonwealth* was a polemical treatise containing a mixture of inconsistencies, truth, half-truth, and unconscious misrepresentation of the truth.

Lloyd wrote from a deep concern over the unequal distribution of wealth in American society. "The striking feature of our economic condition is our poverty," he thought, "not our wealth." As Lloyd viewed the situation, "The unfittest, economically, survives." "Ruin is already hard at work among us" and "Everything withers—even charity,"[13] he lamented. Appalled at the ills he observed in American society, he easily donned the armor of St. George against the dragon—Big Business epitomized in the Standard Oil combination. Trained neither as an economist nor as a historian, and experienced only as a reporter in the days of relatively low standards of journalistic accuracy, Lloyd could not be expected to sift, weigh, and present evidence objectively. His was a strident voice speaking in a depression.

Meanwhile, George Rice was fluttering over Standard Oil like an avenging angel. He never ceased his efforts to harass the combination. He engaged in correspondence with Lloyd and supplied information to him. Rice's appeals to the Interstate Commerce Commission against railroad discriminations dragged on for years. Already in possession of six shares of the Standard Oil Trust in 1892, Rice later acquired an assignment of legal title to another from the liquidating trustees. Against the objections of S. C. T. Dodd, Rice successfully insisted in 1896 upon receiving fractional shares in the twenty companies for some of his Trust certificates, even though no dividends were paid upon the fractions.[14]

By then convinced that Rockefeller and his associates had no intention of liquidating the Trust, Rice took his accumulated data to legal friends, including David K. Watson, the prosecutor of the case against The Standard Oil Company (Ohio) in 1892. The latter aided Rice in presenting the facts and his ideas to Frank S. Monnett, who had been elected attorney general of Ohio in 1896, and to judges of the Supreme Court of the state. Assured that available data justified action, in November, 1897, Monnett filed an information for contempt in the Supreme Court of Ohio against Ohio Standard for failure to divorce itself from the Trust.

Not satisfied with the contempt proceedings alone, between November, 1898, and January, 1899, Monnett instituted *quo warranto* proceedings against all four Standard Oil units in Ohio—The Buckeye Pipe Line Company, The Ohio Oil Company, The Solar Refining Company, and Ohio Standard. The attorney general demanded forfeiture of their charters on

the grounds that all the defendants were members of a trust and as such were acting contrary to public policy; that all four had directly violated the recently enacted Valentine-Stewart antitrust law, operative on July 1, 1898; and that Buckeye Pipe, Ohio Oil, and Solar Refining had conspired with Ohio Standard to evade the 1892 decree of the Supreme Court of Ohio ordering the latter to sever its relations with the Standard Oil Trust. These attacks were only four of many suits initiated by Monnett against railroads, insurance companies, banks, and other corporations in the State of Ohio.

In the course of the contempt suit against Ohio Standard several new brush strokes were added to the picture painted by critics of Standard Oil. Evidence proved that the combination remained intact from 1892 to 1899, managed as a community of interest by owners of a majority of the stock in twenty companies. Newspaper reports played up the bland evasiveness of John D. Rockefeller under interrogation and the loss of temper by John D. Archbold. Monnett slapped a suit for contempt of court upon F. B. Squire, secretary of Ohio Standard, when he refused to produce the books of the corporation. Charges that the company had burned books and papers pertinent to the case, though never conclusively substantiated, provided more exciting copy for the press. Testimony also publicized the fact that Standard Oil had paid for favorable articles placed by Malcolm Jennings in scores of Ohio and Indiana newspapers during 1898 and 1899. Monnett's most sensational move, however, was his announcement that individuals representing Standard Oil executives had offered to pay him $400,000 in return for his acquiescence in dilatory motions by attorneys for the defense and for permitting the case to drag on to an inconclusive end.

More weighty than Monnett's allegations in the long-range attack upon the Standard Oil organization was the testimony for the plaintiff in the *quo warranto* cases. George Rice and others gave information supporting the thesis that Rockefeller and his associates had created a monopoly, that companies of the combination monopolized the purchasing and transportation of petroleum in Ohio, and that unscrupulous Standard Oil marketers had driven aspiring competitors to the wall by a wide range of practices unsanctioned by ethics or law. Even though many of the accusations were denied, through the medium of the press the assertions of critics became a part of the popular impression of Standard Oil behavior.

The State of Ohio won none of its suits against the Standard Oil corporations. The judges of the Supreme Court dismissed the contempt suit

against Ohio Standard on December 11, 1900.[15] Within another seven weeks the contempt case against Squire and all the *quo warranto* suits were also dismissed.[16] That these actions were in general accord with public opinion in the state may be surmised from the refusal of the voters in 1899 to return Monnett as attorney general for another term.

Litigation in other states, especially in Pennsylvania and Texas, contributed still more data to the public concept of Standard Oil's activities, data that gave substantial support to critics of the combination. Suits growing out of the attempts of J. J. Carter and J. C. McDowell, acting for Standard Oil, to influence or control the Producers' Oil Company, Limited, and the United States Pipe Line Company elicited attention in Pennsylvania newspapers. Though the moves of Carter and McDowell failed of their object, they showed how far executives of the combination would go to achieve their ends.[17] Criminal trials of local representatives of the Waters-Pierce Oil Company as violators of Texas antitrust laws also went through both state and federal courts between 1894 and 1902 without resulting in final convictions, but these legal struggles left many voters certain of the misbehavior of Standard Oil men. Even more convincing was the successful suit of Texas against Waters-Pierce for the suspension of its permit to carry on business in the state. Begun in 1896, the case was carried to the Supreme Court of the United States, where the decision of the lower court in favor of the state was affirmed in 1900. In the course of the trial the prosecution alleged, and proved to the satisfaction of the court, that Waters-Pierce, as a part of the Standard Oil Trust, had engaged in numerous unfair marketing practices. Pierce was allowed to continue operations in Texas only after the liquidation of the old corporation, the creation of a new one of the same name, and the legal transfer to him of all shares previously held by Jersey Standard.[18]

Before the situations in Ohio and Texas had been clarified, Archbold and his associates had to face criticism presented to an agency of the federal government—the Industrial Commission.[19] Created under authority of an act passed in 1898 to investigate a wide range of economic conditions in the United States, the new body began hearings on industrial combinations in April, 1899. It was made up of four senators, five representatives, and ten private individuals. Among the latter was Thomas W. Phillips, a leading figure in the Pure Oil combination and former congressman, who was the original proponent of an investigating commission like the one on which he was now asked to serve. During absences of the ailing chairman, Senator J. H. Kyle of South Dakota, Phillips often pre-

sided over the Commission in his capacity as vice-chairman. He had no difficulty in recognizing any of the chief critical witnesses—James W. Lee, T. B. Westgate, and Lewis Emery, Jr., of The Pure Oil Company, Limited, George Rice and T. F. Davis of Marietta, Ohio, the crusading Frank S. Monnett, the ultra-independent M. L. Lockwood, and A. D. Call, opponent of Imperial Oil in Canada. Phillips himself stepped down from the chair to answer challenges from John D. Archbold.

The significance of the testimony lay in the reiteration of the whole range of accusations against the Standard Oil family of companies before a federal agency. The hostile witnesses added no new misdemeanors to the list charged to the "Octopus," but they read all the familiar allegations into the national record and brought in some of the newest data from recent litigation. Not to be ignored is the fact that public damnation of a dominant competitor was far from exceptional business practice fifty years ago. As mentioned later in this chapter, Standard Oil men replied in kind.

Among metropolitan newspapers the New York *World* took the lead in espousing the cause of the little men against the giant. "Nobody ever stops a steal unless the *World* interferes,"[20] ran one of its comments. *World* reporters played up the accusations of detractors of Standard Oil and played down public statements of Archbold and his associates before the Industrial Commission and elsewhere. Consistently appealing to the emotions and prejudices of the multitude, writers and editors alike seldom stopped to verify the accuracy of the allegations of Standard Oil opponents so sedulously reproduced in the newspaper's columns.

When a special news item came up, *World* reporters often took occasion to attach to it as many other allegations as possible. When presenting rumors in 1894 about the division of the world's markets between Standard Oil and the marketers of Russian petroleum, "regardless alike of kings and constitutions and of right and justice,"[21] writers added an extensive résumé of alleged Standard Oil activities in combating the attempts of the independent producers and refiners to run a pipeline to the seaboard and to market their products in the United States and Europe.

The *World* was also one of the chief media for identifying outside activities of Standard Oil executives with those of the combination itself, thus leaving the impression that the "Octopus" was extending its tentacles over the entire economy of the United States. In fact, the investments of Standard Oil executives in outside enterprises gave rise to much of the antipathy to the combination itself. During the years 1896-1898, for ex-

ample, the paper published a series of rumors and reports that Standard Oil was taking over the menhaden oil and ice industries, the National City Bank, and the American Tobacco Company, to mention but a few. The peak was reached in a headline of "Standard Oil to Swallow All" over a story from a Chicago paper that the oil corporation was taking over the leading manufacturers of sugar, lead, leather, rubber, tobacco, alcoholic spirits, cottonseed oil, and gas.[22] Almost every time a Rockefeller or Rogers or Payne made an investment, it was connected with the Standard Oil Company and all retractions or denials went into inconspicuous sections of the paper. It was natural for one of the *World's* readers, having noted that the federal government had appropriated funds for the Geodetic Association in order to ascertain the size of the earth, to observe that the information would be valuable, since it would "enable the Standard Oil Trust and other trusts to learn the exact size of their property."[23]

Probably the most intemperate language of the *World* regarding Standard Oil executives appeared in a feature article in 1897:[24]

> There has been no outrage too colossal, no petty meanness too contemptible for these freebooters to engage in. From hounding and driving prosperous business men to beggary and suicide, to holding up and plundering widows and orphans, the little dealer in the country and the crippled peddler on the highway—all this has entered into the exploits of this organized gang of commercial bandits.
>
> And through it all there has ever run a fine, canting vein of snuffling godliness. Above the roar of incendiary flames and exploding oil refineries has always been heard the rich nasal twang of the doxology.

In extenuation of the *World's* behavior, it must be remembered that the upholders of objectivity and accuracy in news reports and editorials were so few as to constitute exceptions to the rule in the 1890's. Pulitzer's paper merely utilized the techniques which Hearst's *Journal* had adopted with conspicuous success in arousing the American people to war fever against Spain between 1895 and 1898, so pungently portrayed by Walter Millis in *The Martial Spirit.* In fact, the *Journal* seldom lagged far behind the *World* in attacking Standard Oil, while such papers as the *Pittsburgh Leader,* speaking for the superiority of Pennsylvania-grade oil, the *Star and Kansan* for Mid-Continent oilmen, and *The Petroleum Gazette* for Pure Oil yielded nothing to either of the sensational metropolitan dailies in presenting the independents' point of view. Certainly, the most ardent defender of Standard Oil policies, the *Oil City Derrick,* belonged as much in the main journalistic stream of the time as any of its opponents. All

had found, as one writer said in another connection, that "hatred and misrepresentation are dangerously salable commodities."[25]

Out of the welter of reiterated accusation and the combination's defense, which is discussed in the next section of this chapter, Ida Minerva Tarbell fashioned the first coherent, historical narrative on Standard Oil activities. After some years of research she began publishing *The History of the Standard Oil Company* in serial form in *McClure's Magazine* during 1902. Two years later, soon after the last installment had appeared in the periodical, S. S. McClure published the articles as a book in two volumes. Buttressed by numerous documents and excerpts from testimony in voluminous appendices, the manuscript possessed the appearance of an objective, balanced analysis. In fact, it has been so regarded by many scholars and general readers for fifty years.[26]

While ostensibly writing a careful appraisal of Standard Oil's evolution and operational record, Miss Tarbell actually painted an unbalanced picture. Taking a lead from the *World,* she made her story more interesting by personalizing it—by making John D. Rockefeller the chief architect, builder, and operator of the combination. She repeated the incorrect assumption, forcefully asserted by Lloyd, that the Oil Regions had been prosperous before Rockefeller and his machinations brought bankruptcy and ruin. She accepted the time-hallowed assertion of independent oilmen that the phenomenal growth of Standard Oil was attributable chiefly to transportation—particularly to marked favors from railroads and to control of pipelines. She tended to weight heavily all evidence supporting the contentions of Standard Oil critics and to undervalue factual data on the side of the combination. Miss Tarbell's book included only one chapter on the "legitimate" achievements of the Standard Oil group, while she devoted fifteen chapters out of the remaining seventeen to an exposition of allegations against the organization. More than half of the space in her narrative was concerned with the period before the creation of the Trust.

Miss Tarbell's work is actually so replete with contradictions and errors of omission that full analysis would necessitate a monograph, but limitations of space permit no more than a few examples at this time. Though she stated in one place that condemnation of unequal freight rates had not yet "definitely crystallized into law" in the 1870's, in another she observed that John D. Rockefeller "must have known that the common law forbade discrimination."[27] While she remarked that "The oil-carrying roads were bullied, persuaded or bribed into unjust discriminations,"[28] she offered no

effective proof of bribery anywhere in her book. Her chapter entitled "Cutting to Kill" left the reader convinced that Standard Oil marketers annihilated competitors ruthlessly, whereas there was evidence in the reports of the Committee on Manufactures and of the Industrial Commission, not to mention the discussion of The Pure Oil Company, Limited, in her own book, to indicate that the general price policy of the combination in reality encouraged competition to grow stronger, as it did.

Miss Tarbell's bias in favor of independent oilmen and failure to produce a balanced narrative had numerous reasonable explanations. She was the daughter of Franklin S. Tarbell, a vigorous opponent of Standard Oil in western Pennsylvania. Her brother was William W. Tarbell, treasurer of the United States Pipe Line and one of the leading executives of the Pure Oil group of companies. Miss Tarbell's training in journalism during the 1890's could scarcely be expected to induce her to adopt the historian's canons with reference to careful selection, weighing, and presentation of factual data. She was writing for S. S. McClure, who, as the editor of the outstanding muckraking magazine of the period, would probably have been reluctant to publish a calm, objective, judicious appraisal of Standard Oil operations. Moreover, as one reviewer pointed out, it was as impossible for an American to write a trustworthy history of Standard Oil in 1902 as it would have been a hundred years earlier for an Englishman to have written a true analysis of Napoleon Bonaparte.[29] Certainly it would have been a hard task for a Pennsylvanian in the days when his state was feeling the competition of newer oil regions.

As a matter of fact, considering the circumstances, Miss Tarbell merits a good measure of praise. She put together, for the first time, a readable, coherent exposition of the main lines of development of the Standard Oil combination and of the leading controversies connected with its history. Compared with Lawson's *Frenzied Finance*, Miss Tarbell's *History of the Standard Oil Company* was a model of objectivity and careful analysis of data. Her story contained much truth, even though not the whole truth. The South Improvement Company was significant in the early history of the Standard Oil alliance, though not so important as Miss Tarbell made it. Favors from railroads aided the combination to emerge and operate successfully, but there were many other factors in that success, and competitors of Standard Oil also received rebates. Standard Oil marketers did reduce prices in competitive areas and did keep them up at noncompetitive points, but the general price level of the combination was high enough to induce competition, not destroy it.

Miss Tarbell paid tribute to the organization and administration of Standard Oil, though she underestimated the importance of new methods and of sound finance in its success.

Reactions to Tarbell's *History* were extreme one way or another. A few disliked it intensely; many admired it immensely. Author of a book on Standard Oil himself, Gilbert Holland Montague characterized the Tarbell *History* as a brief on one side of a case. He pointed out, for example, that the author had selected the affidavits in the Backus episode that agreed with the "common tradition" and disregarded contradictory evidence which was just as easily available. On several subjects discussed by Miss Tarbell, Montague gave evidence on the other side of the case. He believed that her book was "important as stating in popular version the present phase of the legend of the Standard Oil Company."[30]

The reviewer in *The Nation* declared that the book seemed to be written "for the purpose of intensifying the popular hate." He stated that it was "absurd to represent Standard Oil methods as peculiar"; while some of those practices pictured by Ida Tarbell were "odious," competition was necessarily so, as A was out to get B's customers and vice versa. Her book told what was believed, suspected, and charged, rather than giving a complete record of what was done. The chief complaint of the reviewer, however, was that the author treated "grave problems sensationally." Stirring up hate and exciting bitter feelings was not the right method to bring about the necessary reforms. By doing these things the writer was proposing "to educate the people by unfitting them for calm judgment and rational enquiry."[31]

George Gunton developed similar ideas. He referred to the "readable story" as merely a retold tale of Henry Lloyd's *Wealth against Commonwealth* and a "contribution to economic misrepresentation." While Lloyd wrote with "frank animus," Gunton accused Miss Tarbell of appearing to be writing from a detached point of view when she actually was not impartial, thus creating a "distinctly false impression."[32] In addition to giving a different interpretation of some of the facts presented, Gunton attacked journalists for "feeding the popular prejudice against large corporations" in the search for big circulation. "It is bad, indeed, for businessmen to get rich by questionable methods," he wrote, "but it is much worse for publishers to get rich by poisoning the public minds against the institutions of society through misrepresentation."

These opinions, however, were not generally shared. Reviewers in many periodicals welcomed Miss Tarbell's book with acclaim. The *Arena*

referred to it as "virile history instinct with moral potency."[33] The writer contrasted its good style with the depressing effect of the book by Lloyd, "the John the Baptist of the present ethico-economic awakening." "The absorbing interest of the work, the masterly marshaling of facts and the careful handling of details are only surpassed by the judicial spirit that is pre-eminent throughout the work," the reviewer wrote. In the *American Magazine,* Ellery Sedgwick characterized the *History* as "a unique undertaking pursued with industry and a fair-mindedness wholly admirable."[34]

Thousands of readers appear to have hungered for Miss Tarbell's story. Its tone fitted perfectly into the attitudes of the time, and her portrayal of Standard Oil's behavior coincided with popular impressions about the combination. After all, by developing a big business Standard Oil executives were running counter to the economic mores of the time, and they had been reluctant to observe the new rules set up by an aroused public. The relatively full factual information in the *Report of the Industrial Commission,* which gave data on both sides of most controversies, did not have even remotely so much appeal as Miss Tarbell's lively review of sensational episodes. The book probably has been more widely purchased and its contents more widely disseminated throughout the general public than any other single work on American economic and business history. Miss Tarbell's "consummate achievement" was indeed that "no other trust ever caught the imagination of the public" like Standard Oil.[35]

THE DEFENSE BY STANDARD OIL

Standard Oil men took several measures to meet these attacks and allegations. By no means all the literature published between 1892 and 1904 was unfriendly to large aggregations of capital and to the Standard Oil group. A considerable number of writers, including economists, recognized the advantages of concentration in industry, and such support was welcomed by Archbold and his associates. Traditionally silent, Standard Oil itself moved in a variety of ways to acquaint the public with its point of view. It rose to answer particular charges on many occasions and gradually increased the flow of information regarding its operations and behavior not only before courts and commissions but also in pamphlets and the press. By these actions prior to 1904, both top managers and men on lower echelons, notably those in the Legal Department, planted

the seeds of the modern public relations policies of both Jersey Standard and its former affiliates.

During the years 1892 to 1911 the public relations policy of Standard Oil, if such it can be called in view of the informal nature of the evolution, falls into two periods. Although 1904 is taken as the dividing point, both because of the difficulties in Kansas and the change in the company's policy, some of the developments after this date, notably the company's franker statement of its case, began to evolve in the earlier years. Journalists had become so accustomed to referring to the combination's policy of silence under attack that, even after Archbold and his associates had become more openly vocal, the newspapers continued to reiterate the same old idea. To be sure, changes over these years were largely differences in degree. They do not stand out in such sharp relief when compared with later accomplishments, but they are significant in contrast with the policies of the Standard Oil Trust.

Public relations of Standard Oil began at the grass roots, and, though there is no proof that this field was more assiduously cultivated after the increase of criticism in the 1890's, it certainly was tended with the accustomed care of the combination. Attention to quality of oil, service to buyers, and quick response to complaints were part of the informal public relations policy. Men in Standard Oil were aware that neither opinion in oil-producing regions nor the attitude of customers could be ignored. Standard Oil men gave consideration to these problems. The Real Estate and Tax Department, which served pipelines and producing interests, gave marked attention to local feelings.[36] Perhaps no group had public reaction so clearly in mind as men concerned with the natural gas business. Efforts to get rights of way for pipelines and the settling of damages resulting from leakages were not an insignificant part of relations with the public. Small claims were settled promptly and with tact. The letters of the many men who performed these functions bore witness to their awareness that good relations with people was an important phase of their work. Those employed in getting producing leases were likewise conscious that they were representatives of a combination which would be judged by the actions of even its least important agents.

Sometimes Standard Oil employees, intent on their own particular goal, showed resentment at the responsibilities of a big firm. When O. A. Evans of The Prairie Oil & Gas Company was asked, in regard to a lease, to honor claims which he considered not only unreasonable but indefensible in

court, he wrote to New York that if the situation was reversed Standard Oil men would have no recourse, but added: "We, of course, will have to submit to a policy that is best for the general interest. Those people show the white feather and play the baby act."[37]

Even in selecting local institutions to handle current accounts the officers of companies within Standard Oil considered the influence of the bankers. O'Day, explaining to his superiors the reasons for not making use of a particular bank in Cleveland, wrote that its managers "seem to be high up in the banking business, but a long way from the general public."[38] Since unionism was so strong in that Ohio city, public opinion was not a factor to be overlooked.

Not only did field operators strive to create a feeling favorable to Standard Oil, but headquarters reminded them to avoid irritations which arose from the nuisances of the industry. Noxious fumes, explosions, fires, and pollution of water by oil adversely affected public opinion of the industry generally and of Standard Oil in particular. Moffett asked O'Day in 1904 to instruct his men to take special care in handling draw-offs at Sugar Creek. "If we allow oil to get into the Missouri River, there," he wrote, "it will prejudice the public against us."[39]

In general the company's policy during these years was to make no reply in the newspapers to allegations about its past history and to take no notice of sensational writers. For example, Dodd, in a letter to Howard Page on October 29, 1902, advised against answering J. W. Midgley's recent article in *The Railway Age*. The counselor explained that, while he personally thought many of the decisions of the Interstate Commerce Commission in reference to transportation of oil by private cars were "unjust and absurd," the author's summary of them was substantially correct. Although Midgley showed a "vivid imagination" in estimating the past profits of the United Tank Line Company, Dodd wrote: "In my opinion it is not now worth while to publish a refutation of his statements. The matter is ancient history, and rehashing it will serve no good purpose."[40] The lawyer made no specific replies to extreme statements, such as the "slanders" in Lloyd's book, although the less tactful Archbold, in the heat of testifying before the Industrial Commission, referred to it as "cunning fiction, made up entirely of one-sided testimony dressed for sale," and "one of the most untruthful, distorted compilations that was ever inflicted on a suffering public."[41] Some years later, when Archbold was aroused at a particular newspaper's attacks, he restrained himself after Dodd had advised him that because the publication was "utterly regard-

less of truth and decency" it would be "worse than useless to try to set it right."[42]

On the other hand, under certain circumstances exceptions were made to this rule. When H. M. Backus, who had also been a stockholder in his brother's company, sent two unsolicited letters to Rockefeller refuting the famous widow's story that her husband's business had been taken from her without sufficient remuneration, Dodd agreed that these should be published if the writer was willing. The counselor did not release the letters for publication for more than a year, until the account of the widow Backus was again being presented to the public; he then gave the letters to Patrick Boyle to publish in the *Oil City Derrick.*[43]

At one time John D. Rockefeller personally tried without success to encourage a comprehensive refutation of the allegations against Standard Oil by Henry Demarest Lloyd. The Reverend B. Fay Mills of Fort Edward, New York, went to 26 Broadway in 1896 and examined *Wealth against Commonwealth* with S. C. T. Dodd and Frederick T. Gates. The two men gave Standard Oil's answers to many accusations and convinced Mills that all the charges were "at least susceptible of reasonable explanation, and, possibly, of disproof." At Rockefeller's suggestion, the minister then extended an invitation to Lloyd, several ministers (including Josiah Strong and Washington Gladden), and Professors John R. Commons and Richard T. Ely to come to 26 Broadway, where Dodd and Rockefeller would "take their own time" and "put all the facilities of their office" at the disposal of the visitors for an investigation of Lloyd's charges against the combination. Lloyd characterized the offer as "opéra bouffe," and Roger Sherman, the leading lawyer for independent oilmen, thought it "one of the roaring farces of the day." Commons was willing to accept the invitation if Jeremiah Jenks was asked to aid in the investigation. Ely declined on the ground that he was too busy to start such an "immense undertaking."[44] Though Ely's refusal may not have caused the collapse of the project, the investigation never materialized.

The Legal Department, however, did answer allegations on current practices, not only in court but in newspapers. Several illustrations can be drawn from the Ohio cases of 1897-1900. When damaging testimony was presented by a discharged employee, the lawyers recommended that customers should be informed that he stood accused of embezzling funds. After newspapers had carried sensational articles of disclosures in the testimony taken at Marietta, although in Elliott's opinion the "very tame affair" was on "irrelevant matters" heard by the audience of half a dozen,

the lawyers recommended that the company take steps to publish evidence on the other side. Aroused at Monnett's claim that he could not mention the name of the intermediary who had tried to bribe him, for fear of Standard Oil's reprisals, Elliott privately declared: "If we hired a man to bribe the Attorney General we ought to be as familiar with his name as the Attorney General."[45] As soon as Elliott and Kline were "very sure" of their ground, they delivered a letter to Monnett demanding the name of the reported go-between and denying the accusation; they gave copies of the letter to the newspaper reporters. Elliott also advised the president of Kentucky Standard, Alexander McDonald, to contradict the "maliciously false" story locally. In defense of the attorney general it must be noted that he had been approached by an outside "promoter." The fault of Monnett lay in his too quick crediting of unscrupulous methods to Standard Oil. At times of later political stress, however, he continued to repeat the story, even after sufficient proof had been advanced that he had been taken in.[46]

Not only did Standard Oil men defend their actions vigorously in court, successfully in the Ohio cases, but they also presented an outspoken defense of their organization before the Industrial Commission in 1899. Rogers gave information about pipelines and defended their charges. Howard Page's replies were largely on his specialties—tank cars and railroad rates. Both Dodd and Rockefeller elaborated their views on the advantages of combinations.

The longest and frankest statements were given by Archbold. He did not deny that the combination had received rebates before 1887, but he declared false Emery's calculation of favors amounting to $10,000,000. To this and what he termed other "lusty old lies" he offered detailed explanations. He submitted letters from officers of many railroads to substantiate his point that Standard Oil no longer received rebates from railroads. Archbold denied accusations about specific cases of local price discrimination and many other charges, such as opposing the free pipeline bill in Pennsylvania. At the same time, he gave a considered exposition of the contributions by Standard Oil to the industry, presented much detail about its foreign trade, and praised its labor policy. He argued for federal incorporation of companies engaged in interstate commerce, and, in answer to questions, favored the making of reports and publicity of accounts. Archbold also attacked the "utterly indefensible" discrediting of Lima-Indiana oil by its rivals. He did not hesitate to disclose that the Pure Oil people had wanted to work with Standard Oil

and that he and the other managers had declined, both because the step would be illegal and, as he said, because of "our lack of faith in them."[47] Obviously the competitive customs of the time did not call for courtesy.

In addition to denial of many specific accusations and attacks on rivals, the Standard Oil men had presented more exact factual information to the Industrial Commission than had ever before been given to the public either by themselves or probably by any other large company in the United States. The change in 1899 was so marked that the editors of *The Engineering Magazine* contrasted the secrecy of other companies with the frankness of Standard Oil and declared that its managers "now clearly recognize that publicity is the surest safeguard of legitimate manufacturing enterprise."[48]

To forward this idea Standard Oil's testimony before the Industrial Commission was widely disseminated by itself and others. Under the title of *An Inside View of Trusts* the company printed, and distributed free of charge, the four hundred pages of testimony by its officers to all leading public libraries, school and circulating libraries, and governmental depositories in order to gain a wider public for Standard Oil's defense than that reached by the government's *Report of the Industrial Commission.*[49] *The Engineering Magazine* published John D. Rockefeller's statements extolling the advantages of combination in a symposium on the subject of trusts.[50] The *Oil City Derrick* issued the whole report under the title, *Pure Oil Trust vs. Standard Oil.* In its preface Boyle claimed that in the government's publication many leading questions of the investigators were omitted and that the editors had misrepresented the testimony in their "review" and "digest."[51] Several of the changes in wording made by Boyle seem relatively unimportant, and his derogatory remarks on the testimony of witnesses opposing Standard Oil were too sweeping to include the measured statements of T. B. Westgate and T. W. Phillips of Pure Oil.

Meanwhile, S. C. T. Dodd was engaging in a public campaign in defense of Big Business. His statement before the Industrial Commission was only one of the many which he made.[52] In various articles and speeches he developed his theses that there were advantages to society of combination in general and of the Standard Oil Company in particular. Dodd distinguished between good and bad trusts, the latter being those which "unduly restricted production." The former, he declared, increased it. The lawyer acknowledged that governmental regulation was necessary to prevent the unsocial practices of business, but he recommended legisla-

tion against the evils themselves, not against association per se. In much of his writing he stressed the economies of mass production flowing from the combination of capital and the sharing of advanced methods and different abilities. He dwelt on the results of new techniques and reduced costs: the development of by-products, the opening of wider markets, the increased consumption of better products, and the reduction of prices. According to Dodd, Standard Oil did all these things while holding and extending the foreign market for American petroleum. He denied that the combination had destroyed competition.

Dodd also endeavored to draw a realistic picture of business rivalry. "Can persons compete successfully without endeavoring to draw business to themselves, and is not the tendency of all successful competition to force the weaker competitors to the wall?" he asked.[53] "People who invest capital in a business strive to make that business permanently successful. To that end it is to their interest to keep prices at the lowest profitable point in order both to encourage consumption and to keep out competition." Potential competition he considered "as effective in preventing extortionate prices as actual competition." Dodd thought it better for businessmen to combine to avoid the excessive competition which led to destruction. In fact, he considered combination not only to the benefit of society but inevitable. "Competition is a species of warfare," he wrote, "and no law can compel men to continue at war when it is for their interest to agree." Believing that poverty was the result not so much of unequal distribution as the lack of enough wealth, he advocated enlarging production by increasing the amount of capital and co-operation in business. The disagreement on some of these points by Roger Sherman, a lawyer for the Pennsylvania oilmen, and by Terence V. Powderly, speaking as a leader of labor, was part of the lively debate on industrial combinations, one of the most controversial current issues of that day.

Other employees of Standard Oil also occasionally published data on the petroleum industry and the company. H. C. Folger, Jr., was the author of "Petroleum, Its Production and Products," which appeared in 1893 as part of the *Annual Report of the Bureau of Industrial Statistics of Pennsylvania*,[54] and he contributed an article on the industry to *One Hundred Years of American Commerce, 1795 to 1895*, edited by Chauncey M. Depew. Folger's approach was not to state Standard Oil's case but to contribute a calm expository chapter on the history of petroleum. Archbold himself wrote an article for the *Independent* on the "Effect of Trusts

on Labor," an extension of his remarks before the Industrial Commission.[55] In this article he argued that combination made labor more effective. The wastes of competition were reduced by less need for expenditures on marketing. With larger aggregates of capital available more machinery was used, costs were cut and prices reduced; the market was enlarged and the demand for labor increased. It was Archbold's contention that the large concern could pay higher wages, offer greater stability, provide room at the top for men of ability, and an opportunity for them to invest in its stock. These conditions, he declared, were all true of Standard Oil.

Not all writers outside the company were as hostile to it as the critics mentioned in the earlier sections. Favorable articles appeared in many newspapers. Some of these were entirely independent of Standard Oil, but a few had closer connection with it.

Though Patrick Boyle was widely charged with being a kept journalist of Standard Oil, the exact relationship between the two is not clear. Boyle always denied that the *Oil City Derrick* was aided by the combination. Certainly no evidence of loans exists on the books of Jersey Standard and New York Standard, as is true in the case of a few other newspapers at the time. Boyle insisted that he bought the *Toledo Commercial Gazette* in July, 1889, entirely with his own funds. Nonetheless, he always favored the combination and criticized its rivals in articles which were as intemperate in tone as those of some of the muckrakers. That practice cost him more than one libel suit and a payment to the independently minded Lewis Emery.

On occasion Boyle showed the characteristics of an overfriendly puppy. At one time men in Standard Oil were wondering how they could restrain him. He was vigorously defending a policy of a gas company, while managers of the petroleum combination, aware that the public thought of the *Derrick* as expressing their opinions, were afraid that their organization would be credited unjustifiably with another hidden affiliate. The fact that the hint to Boyle was given indirectly through Seep suggests that Standard Oil had no direct control over the verbose Irishman. The fact that he discontinued his writing on the subject immediately indicated his eagerness to please the managers of the combination with whose views he was usually in full agreement.[56]

Extant evidence indicates that Standard Oil did give financial support to a few newspapers, though not to so many as critics implied. For example, one of the Standard Oil companies made a loan to the *Bradford Era*, with which Boyle was connected. This was for the purpose of keeping

alive a morning competitor to Lewis Emery's evening paper. Another loan was made to a small local Pennsylvania newspaper owned by the friend of one of Standard Oil's production men.[57] There may have been loans to other newspapers during this period, but no evidence has been found.

Standard Oil's contact with George Gunton was of a different character than that with Boyle. Although for some years the company helped to finance Gunton's work, he was an independently minded journalist. English-trained economist, former labor leader, and advocate of the eight-hour day, Gunton held and expressed many ideas contrary to those of Standard Oil managers. His annual subsidy of $15,000 from Standard Oil helped to support his work in adult education in New York as well as *Gunton's Magazine,* both of which were aimed at inspiring reasonable and intelligently calm discussion of the economic problems of the time. Gunton criticized emotional pulpit economists and sensational newspapers which flourished on prejudice. His magazine stood for fair and free discussion. Believing, as he stated, that "political economy" was "a dynamic problem" and that "the notions of original and surprising minds are always the hope of the future," he published the articles of a wide variety of thinkers, Booker T. Washington, Edwin R. A. Seligman, Carroll Wright, and Albert Bushnell Hart, among others. Gunton personally was strongly in favor of organization for both businessmen and workers. Repeatedly he editorialized in favor of the advantages of the large corporation, especially on its effect on stability. With such articles as these Dodd must have found himself in complete agreement. On the other hand, Gunton's views that all questions of labor policy should be the subject of "mutual consideration by equal representation" of employers and employees certainly went beyond the practice of Standard Oil management for many years.[58]

Standard Oil withdrew its financial aid to Gunton in 1904. The reason Dodd gave was that he hoped that Gunton's enterprise would become self-sustaining, "as it well deserves to do." The economist's divorce might have been a factor in the decision, for the attorney remarked to Archbold, "What we want to avoid is a public scandal."[59] Furthermore, the withdrawal of unpublicized aid to a periodical was in keeping with Standard Oil's new policy of more open publicity.

As early as 1898 Standard Oil began to change its relations with newspapers. Instead of making loans, as had been done for a few journals in Pennsylvania, Archbold and his associates decided to make contracts

for advertising and news insertions with a large number of editors. This policy was first adopted in areas west of Pennsylvania. At the height of the newspaper attacks in Ohio during the contempt and *quo warranto* cases Standard Oil employed, through Henry Apthorp, newspaperman and lobbyist, the Malcolm Jennings News Bureau and Advertising Agency.[60] Apparently one of the reasons for this step was the fact that the company thought its point of view was receiving scant attention from the press in this area and newspapers did not want to make any direct connections with Standard Oil. Jennings made contracts with about 150 journals in Ohio and Indiana. Most of the expenditures made under the arrangements with the newspapers were for ordinary advertisements of products, while about a fifth of the payments were for reading notices or news items, for which the publishers received three cents per line, a common practice of the time. The notices were not labeled as paid advertisements and were characterized by *Collier's* as "tainted news." Often these items were copied from other newspapers which had independently printed ideas for which Standard Oil now wanted a wider circulation. Sometimes the articles were written by Jennings. This newspaperman testified in the Ohio cases that he was instructed not to cast reflection on the attorney general of Ohio. In fact, opinions on current controversial subjects were not included in these articles, although D. J. O'Day occasionally would ask men who were independent of Standard Oil, but friendly to it, to write signed letters to the press on debatable questions.

At about the same time that the arrangement was made with the Jennings agency, Standard Oil discontinued committing itself to give financial aid directly to any newspapers. Scores of requests for support had come to 26 Broadway, not only from small but from some leading papers, either to help in a special anniversary issue or to aid in an emergency a part of the press which held economic or political views not so readily salable as the more sensational. The managers of Standard Oil, "for self protection," decided they could not discriminate between journals and refused all requests.[61] This decision appears to have been reached about 1898 and was firmly established five years later, when notice was given to Gunton that aid to him would cease.

Standard Oil executives maintained friendly relations with news reporters in general, though probably they were less agreeable to men from the *World* and the *Journal* than to others. Many of the leaders in Standard Oil gave interviews freely. Until after the close of the century Flagler was responsible for all communications with the Associated

Press.[62] Dodd's name was often connected with factual news releases. The Bedfords appear to have been especially genial with the press, and, though the reports of the agreements with the Scotch shale interests were never so complete as the historian would wish, no Bedford appears to have been coy when approached by either a Scotch or American journalist. One is tempted to surmise that the fact that Brooklyn, home of the Bedfords and the Pratts, was the only city except Cleveland to contribute more than one native son to the Jersey Standard Board of Directors before 1911 accounted for the particularly favorable reception at 26 Broadway of reporters from the *Brooklyn Eagle.*[63] Numerous fat books in Jersey Standard's clipping collection, dating back to 1896, attest not only to the tremendous number of columns devoted to the petroleum industry generally, and to Standard Oil specifically, but also to the company's interest in such news and to the number of interviews granted by Standard Oil men.

Authors collecting facts for books were also welcome at 26 Broadway. John J. McLaurin, Oil Regions journalist, was given information for his *Sketches in Crude-Oil,* and Dodd purchased one hundred copies of the third edition in 1902 as a means of disseminating ideas favorable to Standard Oil.[64] Charles Whiteshot could acknowledge not only admission to plants but interviews with all the leading stockholders and officials of Standard Oil during the five years, starting in 1900, when he was collecting material for his mammoth work, *The Oil-Well Driller: A History of the World's Greatest Enterprise, the Oil Industry.*[65]

Throughout these early years Standard Oil's relation with Ida Minerva Tarbell was also friendly. She appears at one time, while collecting data, to have had a desk at 26 Broadway, a scarce item in the days of rapid expansion. Rogers had interviews with her. S. C. T. Dodd personally prepared some material for her, read her account of the Buffalo case when submitted to him for comment, and wrote a tactful, two-page, detailed letter, pointing out where he considered her interpretation was wrong and giving her supplementary evidence, which she did not use. Daniel O'Day, probably in part because of his friendly relations with her brother, W. W. Tarbell, and flattered by the author's comment that she wanted information to show how much O'Day had built, collected material for her on the early development of pipelines, although his associates characterized the subject as "ancient history."[66] In 1903 C. N. Payne, annoyed at her implications that the "immediate shipment" had gone on for a long time and at omissions in her story, declared in a letter

to O'Day that Miss Tarbell had given an entirely wrong impression of that situation and of the company's motives. "She will only use such parts of information given her as she can construe against Mr. Rockefeller and the Lines," Payne observed.[67] It was not until 1906, perhaps because of the extremely bitter articles on Rockefeller in *McClure's Magazine* the previous year, that Standard Oil changed its policy toward Ida Tarbell. When she was going to Indiana and Ohio to collect more material, O'Day advised the company's employees: "Simply ignore her entirely."[68]

Standard Oil purchased a considerable number of copies of Miss Tarbell's *History*, though the exact figure is not a matter of record. As criticism in Europe and other areas was aroused by her work, executives at 26 Broadway sent copies to their foreign managers but accompanied each book with a review, probably that in *The Nation*, which the company had reprinted and distributed in the United States.[69]

Soon after Ida Tarbell's articles began to appear in *McClure's Magazine* Standard Oil financed the publication of *The Rise and Supremacy of the Standard Oil Company*, written by another independent author, Gilbert Holland Montague. While a student in 1900, he had been awarded the Bowdoin Prize at Harvard University for an essay covering the development of the company from 1865 to 1878. This was later submitted to Dodd, who pointed out some factual errors and commented: "The loose assertions made in so-called investigations were often utterly incorrect, yet I suppose they must be relied on in writing history." This article and another, which carried the subject to 1903, were published in the *Quarterly Journal of Economics*, after which the top management of Standard Oil was willing to examine the work. Dodd recommended it to Archbold as not eulogistic of the company, as being "as correct as the public documents," and as fair a history as could be compiled without inside information. After a careful reading of the articles, the managers decided to finance their appearance in book form. Harper & Brothers published five thousand copies at the modest charge of thirty-five cents each.[70] It is not known how many were sold to the public at a small per unit profit to Standard Oil and how many were distributed free to key employees and to a number of ministers, some of whom at this time were busier fighting trusts than the devil.

STANDARD OIL'S POLITICAL ACTIVITIES

Not an unimportant part of Standard Oil's relations with the public was its participation in political activities. Since almost every large cor-

poration was under suspicion as an enemy of small enterprise from the 1870's onward, no combination could ignore politics if it wished to avoid legislation adverse to its interests, and Standard Oil was no exception to the rule. That the officials of the combination individually participated in political action is well established, but two questions have consistently arisen in every discussion of the matter. Did Standard Oil control state legislators and congressmen? And did Standard Oil men overstep the practices of that time and the bounds of ethical conduct? There is no doubt that some of their behavior would not be acceptable today, but the customs and mores of the electorate, as expressed in law, have changed during the past fifty years. To evaluate the conduct of men of the past in relation to the background of their own times becomes a very difficult task when the evidence is not only conflicting but inadequate.

Standard Oil men were really on the horns of a dilemma with regard to political activity. Prior to the 1890's measures against the organization directly were relatively few, and the executives could normally pursue a strictly defensive policy. They could afford the luxury of taking action only when specific proposals were contrary to the interest of the combination. As antitrust sentiment grew stronger and public attacks upon Standard Oil more bitter, the situation called for more positive steps. Yet public clamor presumably would have risen higher if the unpopular organization had openly expressed its opinion in affairs of state.

Several factors in the situation can be considered and briefly dismissed. Standard Oil men adopted surreptitious procedures, the methods normally used to obtain political ends until such activities are forced into the open by public opinion and regulatory legislation. Secondly, Standard Oil was a very large organization, with thousands of men of differing political complexions. Many employees would have objected had the leaders identified the entire oil combination with one party, though on occasion all could work together in supporting candidates whose views coincided with the general interest of the combination. In the third place, Standard Oil's political activities grew in the 1890's and later, not because Rockefeller stepped out and Archbold assumed the leading position,[71] but because officials thought it necessary to fight a rising tide of legislative measures aimed at controlling large corporations, particularly the oil combination. The electorate demanded curbing of the trusts, an increase in taxation, and other measures contrary to the considered desires of the men at 26 Broadway.

In the heat of popular opposition to Standard Oil, statements regarding

its undue influence often strained the comprehension and patience of its officials. When a member of the Ohio legislature accused Standard Oil units of coercing producers into signing a petition against a bill regulating pipeline charges, Elliott wrote privately that if the accuser had been "more familiar with the average producer he would know how ridiculous such an assertion appears to people engaged in the oil business."[72] To counteract such untrue allegations, of which this is one of many, was at once a responsibility for leaders of the combination and a virtual impossibility. Executives had to face the fact that the popular impression was that their organization controlled the selection of legislators and judges and coerced employees into voting as management dictated.

Some Standard Oil field men did encourage their employees to take part in elections. As an employee of the South Penn Oil Company in the 1890's, Michael Benedum, later a great wildcatter, records his discomfiture when John Worthington asked Mike to vote for a Republican favorable to Standard Oil aims in West Virginia. Submerging his Democratic inclinations, Benedum voted as he was asked. In another instance, in 1900 a local superintendent of the Forest Oil Company reported that he had persuaded his men, about 450 all told, to register and pay their taxes "in such a way as not to excite comment or hostility."[73] He thought, though he was not sure, that, with few exceptions, the men would vote for the local candidate for Congress who was favorable to the interests of Standard Oil.

This case of Forest Oil illustrates two points about the political activity of Standard Oil managers. It shows the care which company representatives had to adopt in order not to stir up resentment or suspicion, or both, against the organization. It also provides an example of the fact that in some instances Standard Oil supervisors did try to influence employees to vote for the "right" candidate for office, even though secret voting made it impossible for managers to be certain that the workers followed requests made.

While some field supervisors went further than the Forest Oil superintendent, others did less in the political sphere. Worthington was especially active in West Virginia in the 1890's, so much so that his private political correspondence was later published as *The Worthington Letters*, to the embarrassment of Standard Oil and himself. On the other hand, few pipeline superintendents probably tried, or had little success if they did try, to induce their Irish Democratic employees to vote for Republican candidates, even if the latter were in some cases the supporters of Big Business and thus indirectly of their jobs. Mike Benedum

salved his conscience by voting the straight Democratic ticket except for the one pro-business Republican. Employees of Standard Oil companies frequently openly denied that local officials had influenced their votes in any way.[74]

Though there is little evidence that Standard Oil as such brought pressure of any consequence to bear upon employees at election time, officials personally aided in defeating candidates for offices on more than one occasion. One example occurred in 1901. Having failed to be renominated as candidate for attorney general on the Republican ticket, Frank S. Monnett, archenemy of the combination in Ohio, turned Democrat in 1900 and within a few months sought the same office on his new party's ballot. Kline, Apthorp, and D. J. O'Day attempted to take advantage of the conviction on the part of many Democrats that Monnett's conversion was too recent for him to represent them. One of Kline's Toledo friends came out as a candidate for attorney general, which meant that Mayor "Golden Rule" Jones would have fewer delegates in the nominating convention to deliver to Monnett. Taking advantage of the unwillingness of the convention to place two men from the same county on a state ticket, other opponents of Monnett induced a man from the same home town to run for judge.[75] Obviously, Standard Oil men could take some, though limited, credit for Monnett's political reversal in this instance.

Some events at the time of the struggle between Mark Hanna and Tom L. Johnson for election as senator from Ohio in 1903 illustrate the fact that relations between the many companies in Standard Oil and politicians were neither so simple nor so close as often implied. At the time that Standard Oil was being accused of aiding Hanna, the latter wrote to M. B. Daly, manager of Standard Oil's affiliate, The East Ohio Gas Company, that a boss of a pipeline gang was reported to be asking his workers to boycott a cigar store because its owner had not come out in favor of Johnson. In reply Daly asked the name of the boss, but added: "We are not taking any part in the campaign, and have not asked a single man to vote the ticket either one way or the other; and I am sure that no officer of this Company would try to influence the votes of the men. We do not know their politics, and while, personally, I am affiliated with the Democratic party, Mr. Richardson, the Superintendent, is a Republican."[76] At the same time, Daly had refused support to Johnson's campaign fund, although as mayor the latter had granted the franchise for natural gas in Cleveland. Daly had also parried the reformer's request for lower gas rates for his own home with the assertion that the large domestic consumers

could best afford to pay and that the company's policy of a uniform rate was in line with Johnson's own motto: "Equal rights to all."[77] Meanwhile, some of Standard Oil's other gas and pipeline men were actually working to secure the re-election of Senator Hanna, while naïvely assuring Daniel O'Day: "We of course will do our work in this instance, as we have in the past, without attracting any attention, or anyone knowing what we have done."[78]

Maintaining a proper attitude toward the selection and behavior of judges was regarded as an especially ticklish proposition. On one occasion Elliott pithily expressed one necessarily potent consideration: "We must never lose sight of the fact that it is wise to be on good terms with the judges who are presiding in the courts where we have large interests."[79] On the other hand, Dodd, who always upheld the highest standard of behavior, strongly advised all executives to avoid interfering in the actual nomination of judges.[80] Nevertheless, candidates were often diplomatically and quietly assured of Standard Oil wishes for their success: one representative of Standard Oil, speaking to a candidate for a district judgeship, stated that Elliott as an intermediary for the combination would "never ask for nor desire more than" to have "judges who will at least try to stand up and administer the law as it is written in spite of any clamor that may be made."[81] And when at one time an executive showed an inclination to take retaliatory measures in an election against a judge who had rendered a decision contrary to the hopes of an affiliate, Dodd opposed him with the blunt statement, "The decision correctly stated the law, and could not have been different."[82]

Men within Standard Oil naturally took part in trying to influence legislation which was to the interest of their business. Vigorous voters and pressure groups always take positive positions in legislative halls. In key areas there were lobbyists or legislative representatives in the company's service, keeping it informed of developments, trying to forward such measures as opening Indian Territory to the building of pipelines and opposing antitrust bills and increases in taxation. Dodd advised subscription to the New York Tax Reform Association and the sending of copies of editorials which agreed with his company's own point of view to representatives in Washington. He personally authored a pamphlet opposing a series of federal and state bills. Standard Oil men frequently circularized petitions favoring state legislation which would forward their companies' interest.[83]

Some of the political actions of Archbold and Standard Oil during

these years prior to 1905 were later exposed in the press. In 1908 William Randolph Hearst, pressing the candidacy of Thomas L. Hisgen, "independent" oilman, as the Independence League candidate for President of the United States, read a series of letters written by John D. Archbold to men in public office, notably Senator Joseph B. Foraker of Ohio. The letters were subsequently published in *Hearst's Magazine.* They suggested a close connection between contributions to campaign funds and legal fees on the one hand and requests for opposing bills, the nomination of judges, and the like on the other.[84]

Elliott declared in a private letter that in his judgment everything could be explained as "consistent with strictly honest business methods."[85] The skeptic might consider this a cautious statement of a lawyer whistling in the dark, but the characterization hardly fits Elliott. Although the counselor did not elaborate his point, Senator Foraker publicly insisted that the payments were fees for bona fide legal services. Other members of Congress at the time also accepted pay from private enterprise for legal advice and aid.

In judging the correspondence the political climate of the time certainly must be taken into account. The Archbold letters themselves had been stolen by an employee of Standard Oil, bought by the *New York American* in 1904, and then saved until the time called for a sensational disclosure. The fact that a few of the letters dated 1898 to 1904 were shown to be typed on a machine not made prior to 1905, and that both sides of one correspondence used the same typewriter, throws doubt on the authenticity of these letters, and is likely to make the reader question the way in which others were used out of their context.[86]

Other considerations which should be weighed in a full appraisal of Standard Oil's political activities are numerous. Such campaign contributions as the $250,000 in 1896 and the $125,000 in 1904 to the Republicans, the last payment being in the name of H. H. Rogers, were undoubtedly made by one of the Standard Oil companies. Archbold admitted the fact. Another question is the extent of political payments by competitors of Standard Oil. It is well known that the policy of several Pure Oil officials was to get elected to public office in Pennsylvania and that T. W. Phillips even went to the national House of Representatives. Their method had the advantage of being a frank pursuit of their business aims in the political sphere, while Standard Oil men resorted to paid spokesmen in the day when lobbyists were not compelled to sign a public register. Finally, it must be remembered that, though legally persons

before the law, corporations were in the course of having their privileges somewhat circumscribed early in the twentieth century. The situation of an executive of a large corporation was such that he might well endanger the well-being of his company by openly fighting for what he considered the best interests of his organization.

Though a reader of the Archbold-Foraker letters and the later Clapp Investigation comes to the conclusion that the policies of Standard Oil toward politics overstepped the bounds of standards generally observed today, the evidence as to whether the combination went beyond the practices of its time is indeed clouded. Contributions by corporations to national campaign funds were not forbidden until 1907, which indicated that even before Hearst's disclosures in 1908 a majority of the voting electorate had decided that the practice should be curbed. Of another fact there is no question. The stolen letters created a sensation and an extremely undesirable impression of Standard Oil methods in 1908. By that time, however, many events, discussed in the next chapter, had already harmed the combination's relations with the public.

The onslaught of Lloyd, Rice, Emery, Pulitzer, Hearst, federal investigators, and others, all effectively synthesized by Ida Tarbell, prodded Standard Oil men into modifying their traditional attitude toward the public between 1893 and 1904. By making a series of adjustments to specific situations, executives at 26 Broadway actually adopted a positive, though undefined, policy. They still refused to answer newspaper allegations regarding early misdemeanors but met false accusations as to current practices with outright denials, fought cases vigorously in the courts, gradually abandoned surreptitious subsidies to newspapers and periodicals, sought to achieve a more favorable reception in the newspapers through the agency of Malcolm Jennings, and frankly gave the Industrial Commission more information on the operations of Standard Oil than had ever been presented to the public. While aiding several authors in collecting and publishing facts on the oil business, Standard Oil representatives or spokesmen distributed a considerable body of literature favorable to the company and countered the rising political opposition by stepping up lobbying activities in several states. Though much of the campaign by Standard Oil was open and aboveboard, other parts were kept as secret as the situation permitted.

Leaders of the corporation, prominently aided by counselors Dodd and Elliott, had gone far toward altering Standard Oil's so-called policy of

silence, though neither they nor the press seem to have registered the change. The continuously reiterated fable about the silence of the combination in the years after 1898 was no more revealing of actual practices than M. F. Elliott's later statement that Jersey Standard had no "fairly defined" policy in its relations with the public "except to sell goods to as many people as we can, at a fair price."[87] Before that view was expressed all Standard Oil employees had gone about their business, during the years 1904-1911, under unprecedented fish-bowl conditions which led to still further alterations in the public and legal status of their company.

Chapter 23

The Path to Dismemberment, 1904–1911

JUST AT the moment that Tarbell's *History* appeared in the bookstores of the nation, petroleum developments in the Mid-Continent region set off a train of events which culminated in the breakup of the Standard Oil family. The agitation in Kansas soon transformed a local conflict into a national political issue. Unprecedented were the planning, breadth, and vigor of the campaign against the oil "Octopus." It was attacked in newspapers and periodicals, in legislatures and in courts, both federal and state. While most employees of Standard Oil went about the business of supplying light, fuel, and lubricants to the markets of the world, leaders and lawyers of the combination combated the attacks with every weapon that they could devise and command.

A STORM GATHERS IN KANSAS

Trouble gathered slowly in Kansas throughout 1904 and flared early in 1905.[1] Political conditions in the state provided ample tinder, and the rapid increase in production poured a flood of inflammable oil on the fire.

In spite of prodigious labors, Standard Oil men failed to keep up with the rapidly increasing flow of oil in the Mid-Continent. Production in Kansas alone jumped from 932,214 barrels in 1903 to 4,250,779 the following year. Standard Oil companies built storage facilities of unprecedented capacity and constructed pipelines of previously unexceeded length. Other affiliates of Standard Oil doubled the capacity of the refinery at Neodesha and constructed another at Sugar Creek, while facilities were being completed to carry crude petroleum to refineries at Whiting and on the East Coast. Standard Oil was unable to handle the flood of oil quickly enough, however, to satisfy the growing number of eager producers.

In 1904 The Prairie Oil & Gas Company reduced the price of crude. With an investment of about $5,000,000 in storage and pipeline facilities for Kansas, a rising amount of funds in stored crude oil, and an awareness

of the future possibilities of production in Oklahoma, the company considered this policy necessary.[2] The quotation for the best grade dropped from $1.38 per barrel in late 1903 to 80 cents in 1904 and continued downward.

Furthermore, other policies of Standard Oil increased antagonism. As the high-quality Oklahoma petroleum became available, the heavy oil in Kansas declined in reputation. Prairie Oil & Gas, which had originally classified Mid-Continent crude into three qualities—North Neodesha, South Neodesha, and heavy oil—from November, 1904, purchased by gravity valuation. C. W. Owston's Fuel Oil Department had been struggling unsuccessfully to find a sufficient market for the heavier oil, and for several months from March to June, 1905, The Prairie Oil & Gas Company refused to take petroleum of under 30° Baumé.[3] The fact that throughout this time the price of kerosene in Kansas was not reduced proportionately to that of crude oil also aroused criticism.

The pattern of financing crude production in the state accentuated the agitation. In Kansas many of the approximately five hundred producing companies, some not too soundly financed, were unable to pay dividends to their large number of local stockholders as prices declined; in fact, some of the companies needed a spectacularly high price per barrel to operate successfully. Although in Ohio and Indiana the producers had a lower average cost of production and a wider margin of profit than those in Kansas, they were also less speculative and more experienced in the vicissitudes of the business. Hence, they were not so surprised nor aroused when falling prices followed increased production.[4]

The veteran pipeline man, O'Day, summarized the situation succinctly: "It is the old, old story with the Kansas producers, as well as with other producers," he wrote in the summer of 1904. "As they get too much oil, they must expect the price to decline as in the case of an over-crop of corn or cotton, or any other commodity. When the prices decline they naturally kick very hard."[5]

The sensational part of the press and the political atmosphere in Kansas helped to augment the ill feeling toward Standard Oil, which was in marked contrast to the welcome given the combination at its entry ten years earlier. The state had the exuberance of the frontier, a frontier, moreover, where the Populist seed had taken deep root. As a large producer wrote to O'Day of subsequent events: "I never thought that I would see such rampant socialism in America, but if I ever looked for it, I would expect to find it in the state of Kansas."[6] As more oil was produced and

prices dropped still lower, the flame of antagonism soared. Professional agitators and some newspapermen grasped the opportunity for a sound investment in their own reputations.

Standard Oil men did not remain inactive under the attacks. Early in 1904 O'Day instructed the pipeline men to give their employees full information about the work planned, so that they might tell producers. In the summer two pipeline men, W. F. Gates and John O'Brien, visited producers in Kansas and made an informal study of public opinion in the state. They characterized the situation as "quiet." In spite of the disappointment at the drop in prices, the experienced producers were understanding and friendly to Standard Oil. The pipeline men believed that the agitation came from "tenderfoot producers," "local people with small interests," and the "hot air companies" whose securities declined in value with the drop in the price of crude. Oilmen's associations were reported to be busy with the usual mutual interests of producers: proper plugging of abandoned wells and the costs of labor and supplies. The newspapers, especially those carrying the advertisements of speculative companies, appeared to Gates and O'Brien to be exaggerating the criticism of Standard Oil.[7]

In spite of the reassuring early report, Standard Oil executives took steps to put their views before the people of Kansas. On O'Day's recommendation, Archbold engaged the Jennings Advertising Agency to extend its work to that state. Malcolm Jennings visited Kansas in September and gave a report similar to that of the pipeline men, but he noted that many people were reading the writings of Ida Tarbell and Thomas W. Lawson. Within a few weeks Jennings had signed contracts with newspapers in some thirty towns. Since the articles published, though informative, avoided discussing the current controversy, O'Brien gave interviews to newspapers stating his company's point of view. Elliott himself wrote thoughtful letters explaining Standard Oil's problems to Charles Curtis, representative in Washington from Kansas, and to others whose chief interest he thought was in the welfare of the state rather than in a particular economic interest.[8]

By the time the state legislature met early in 1905, however, the Standard Oil men felt that they had not been successful in putting their point of view before the public. In February O'Brien wrote that, although he and the others had carefully refrained from opposing pending legislation unfavorable to the company's interest, he was leaving Topeka, since nothing would help the passage of the bills more than the suspicion

that he was there to oppose them. In March the veteran producing expert of the company, John Worthington, who had joined the Standard Oil men in Kansas, reported to Elliott that the situation was most serious. Representatives of leading newspapers and magazines in the country were in the state and were copying local papers which he thought were controlled by the agitators. "We can beat the opposition in every other line of work," the producer boasted of the Standard Oil men, but he declared that they needed some competent writers on their side to stem the hostile tide.[9]

A few days later Patrick Boyle arrived in Kansas. The editor had asked Elliott to send him to the storm center. Boyle was referred to in the Kansas papers as the editor of the *Oil City Derrick,* and as "the noted statistician of the oil industry," but it is doubtful if many failed to hear the rumor that he was close to Standard Oil. Boyle did not fail to report to New York that Ida Tarbell, who was speaking at producers' meetings and writing of events, was rumored to be acting as press agent for The Shell Transport & Trading Company, Limited, which was purchasing oil in Texas for the European market. By April Boyle reported that he found leading Kansas papers, with but two exceptions, willing to give Standard Oil a fair hearing.[10]

In the meantime, however, the agitation against Standard Oil had resulted in legislation and litigation. Spurred by the demands of some producers and encouraged by the effective speech of Governor E. W. Hoch, himself the president of a producing company, the legislature passed a series of acts intended to improve the economic conditions of Kansas and to restrain Standard Oil. As O'Brien explained to the managers in New York, most of the members of the legislature, either directly or through "their cousins or their aunts," were stockholders in producing companies. A state refinery at Peru, to be financed by a $200,000 bond issue, was to offer competition to the only well-established refinery in the state, that of The Standard Oil Company (Kansas) at Neodesha. In what proved to be a vain attempt to cloak the projected new institution with constitutionality, it was to provide employment for convicts, some of whom were already busy making twine. The legislature passed a common carrier act to govern pipelines, a maximum tariff act to regulate railroads and pipeline rates, and an anti-price-discrimination act to control the marketing of petroleum products in the state. At the same time the Kansas Oil Producers' Association, employing Frank S. Monnett as counsel, brought against the Santa Fe Railroad an antitrust suit into

which much testimony was subsequently introduced on Standard Oil. On March 2, 1905, Attorney General Coleman of Kansas filed in the Supreme Court *quo warranto* proceedings against The Prairie Oil & Gas Company, asking for a receiver for the company.[11]

The storm in Kansas subsided for a time, although not before it had had far-reaching effects. Years later Phillip Pitt Campbell, a representative of Kansas in Congress during this early period, dated the turning point of feeling at a meeting of producers in Independence early in 1905. First Ida Tarbell spoke. Then Monnett, with all the fire of a reformer, proposed a resolution favoring the ousting of The Prairie Oil & Gas Company in particular and Standard Oil in general from the state. Campbell jumped to his feet to speak out of his proposed turn in order to bring the audience to a realization of the serious economic implication of their intemperate approach to a major problem. Monnett's employment by the producers was ended, and he left the state; the tide of extreme antagonism was turned.[12] Nevertheless, the political atmosphere in Kansas was no more conducive to the development of its petroleum industry than the newspaper publicity about the Kansas affair was to the good reputation of Standard Oil.

While writers for current periodicals took sides on the issues in Kansas, an experienced producer in another field attempted to characterize the complex problem realistically. Writing to O'Day, David J. Kelley declared that conditions were never entirely satisfactory to producers in a new field. The price was never high enough for men taking a chance with the drill, the system of grading never met with their approval, and all their output was not taken. At the same time, because storage tanks, pipelines, and refineries took time to build and the purchasers of crude petroleum were faced by the "universal law of supply and demand," the managers of companies performing these functions could neither provide facilities rapidly enough nor pay the price desired by the producers. Yet Kelley generalized that "the pipeline companies have made the producing of crude petroleum at a profit possible."[13] The struggle was the familiar one of apparently conflicting economic interests, yet of mutual need.

Though conditions in Kansas in early 1905 did not encourage the expansion of Standard Oil's facilities, the company did not lay claim to being free of mistakes itself. W. J. Young, president of The Prairie Oil & Gas Company, replying to the thoughtful suggestions of a friendly producer, declared that he preferred to admit that his company had made

some mistakes. These were to be expected "with the handling of so large a business," but, he added, "they were not made with the intention of injuring anyone."[14] Perhaps he was thinking of the temporary stoppage of work on pipelines and storage facilities, a decision which, though occasioned by the political climate itself early in 1905, undoubtedly increased ill feeling and speeded passage of unfriendly legislation. He may also have had in mind the adoption of the refiners' new method of classifying crude oil. This scientific method, based on the ratios of the different products from various grades of oil, caused friction with producers, as experienced pipeline men had anticipated. Neither side could claim that it had brought to the controversy the judicious calm needed for co-operative and wise solution of a complex economic situation.

STANDARD OIL BECOMES A NATIONAL POLITICAL ISSUE

Although the first peak of antagonism to Standard Oil in Kansas had been passed by the second quarter of 1905, steps had already been taken to sweep the combination into the national spotlight. Representative Campbell, before he calmed the excited Kansas producers, had submitted a resolution in Congress for the investigation of the petroleum situation in his state. As passed on February 15, the resolution assigned the task to the newly created Bureau of Corporations. Since the local situation did "not by any means determine the price of either crude oil or its products or afford a proper basis for understanding the conditions of the industry,"[15] the Commissioner of the Bureau decided that all phases of the petroleum business throughout the United States should be examined. His first report, that on transportation of petroleum, set off a chain reaction throughout the nation and culminated in a suit which was brought by the federal Department of Justice to break up the Jersey Standard family.

Numerous elements in the prevailing situation contributed to the transference of the white heat of publicity on Standard Oil from Kansas to the national stage. Ida Tarbell's *History*, out in book form just at the end of 1904, focused attention upon the alleged misdemeanors of the giant in the oil industry. The book was a topic of conversation all over the nation. Though both as Governor of New York and as President of the United States Theodore Roosevelt had emphasized that combinations were a natural development of modern industrial life and that the government should address itself primarily to correcting the evils growing

out of the evolutionary process, to the chagrin of Standard Oil managers he selected their corporation as one of the bad combinations.

That conviction of the President undoubtedly bore some relation to other political occurrences immediately prior to 1905. Two years earlier Roosevelt had dramatized the fact that Archbold and his associates had opposed the creation of the Bureau of Corporations,[16] though he deliberately ignored their favorable attitude toward the passage of the Elkins Act in the same year. His appetite for big game in the industrial field had been whetted by the success of the Department of Justice in forcing the dissolution of the Northern Securities Company in 1904. Encouragement by the President was not the only factor pushing Commissioner James R. Garfield to make a thorough investigation of the petroleum industry; since his first report, that on the beef trust, had been criticized generally as a wishy-washy job, he probably felt impelled to be more comprehensive and more critical in his next inquiry.

In spite of these unfavorable elements in the situation, Standard Oil officials at first had high hopes that an objective inquiry and analysis would be conducted by the Bureau. They opened their files at 26 Broadway, gave investigators masses of railroad and statistical evidence, and elucidated their point of view in innumerable interviews and hearings. Field men were equally open in their behavior, whether in Kansas or in California. One subordinate in Kansas wrote that the investigators were "very courteous gentlemen" and that Garfield had a "wonderful bunch of questions" which he asked "without any preliminaries whatever." The reporter expressed the opinion that "these people" were "decidedly square" and that the "hot air artists" did not stand "ace high," as they had done in previous investigations.[17]

The release of the first report of the Bureau, dated May 2, 1906, completely disillusioned Standard Oil leaders and friends. It reflected the fact that some of the field investigators, including Frank S. Monnett, were biased against the oil combination and that the traditional assertions of critics had been accepted; the facts, as presented, substantiated and underlined the contention of independent oilmen that railroad discriminations had been of paramount significance in the rise and success of Standard Oil.

"The control of the Standard Oil Company over the entire oil industry is so great as to require a special study of its relations to transportation companies." That was the key sentence in Commissioner Garfield's letter of submittal of the report to President Roosevelt. He admitted that

Standard Oil men had a point in their claim that the location of their refineries and their construction of pipelines were "natural advantages" to which they were "justly entitled" by reason of their energy and foresight. Nevertheless, the Commissioner cautioned readers not to forget that "these advantages were in part obtained by means of unfair competitive methods during years of fierce industrial strife." Less tenable was the assertion: "The Standard Oil Company has habitually received from the railroads, and is now receiving secret rates and other unjust and illegal discriminations." Garfield estimated that the combination had recently saved about $750,000 through secret rates discovered by the Bureau.

The Commissioner cited examples of "important discriminations" by railroads in Standard Oil's favor from New England to California. New England railways refused to prorate—to join in through rates—on oil shipped from west of the Hudson River. The combination achieved an illegal low rate by using blind billing and "the sum of the locals" from Olean, New York, to Burlington and other points in Vermont. Standard Oil maintained "absolute control" of almost the whole area south of the Ohio and east of the Mississippi "by means of secret rates and open discriminations in rates" from Whiting, Indiana, to Ohio River points and to Grand Junction, Tennessee. He added that it enjoyed a similar dominance in Waters-Pierce territory by means of discriminatory rates between Whiting and East St. Louis. According to the Report, Standard Oil received open, unfair rates in Kansas and rebates as well as secret rates in California. At the close of his letter Garfield listed eight alterations in either secret or open rates by railroads after the Bureau began its inquiry, the inference being that the changes were the result of the investigation.

On May 4, 1906, President Roosevelt cited the gist of the Garfield Report in a message to Congress advocating the passage of a bill remitting the customs duty on denatured alcohol. This action by the President—utilizing an attack upon Standard Oil as a club in a matter of no concern to the combination—annoyed Archbold and his associates and afforded one reason for their immediate reaction.[18]

In fact, the contents of the Report and Roosevelt's use of it stung Standard Oil leaders into making a response within twenty-four hours. On May 5 Archbold and Rogers issued a reply, which was printed in leading newspapers and periodicals all over the nation. "It may be frankly stated at the outset that the Standard Oil Company has at all times within the limits of fairness and with due regard for the law," they

averred, "sought to secure the most advantageous freight rates and routes possible."[19] But they vigorously maintained their policy of living up to the law of the land: "We say flatly that any assertion that the Standard Oil Company has been or is now knowingly engaged in practices which are unlawful is alike untruthful and unjust." In passing it might be observed that this statement coincides completely with the intentions expressed in the private correspondence of both Dodd and Elliott, though they did not always correctly estimate in advance the decisions of the courts.

By emphasizing the importance of strategic location of Standard Oil refineries, Archbold and Rogers countered many of the specific allegations that their organization had grown strong through favors from railroads. Instead of conspiring with managers of railways to secure discriminatory rates, they said, Standard Oil had invested millions of dollars in pipelines in order to erect plants at points where it could take advantage of all locational factors, including existing freight-rate structures in many sections of the United States. With regard to rates in New England, the spokesmen suggested that Mr. Garfield should direct his criticism at the existence of Long Island Sound as a competing means of freight transportation. Archbold and Rogers denied that Standard Oil had any responsibility for specific rates anywhere in the country. They pointed out that the only instance of alleged current rebates was entirely within the state of California. Such payments they asserted were outside the jurisdiction of the Interstate Commerce Commission, "involved no turpitude whatever," had grown out of rapidly expanding business in the earliest years of the century, and were actually downward adjustments of overcharges by the railroads to Standard Oil and other shippers.

At one point Archbold and Rogers definitely departed from a tone of dignified protest at misinterpretation of the facts. "It is not easy to differentiate between Mr. Roosevelt, the President, and Mr. Roosevelt, the individual," they remarked. "He has given us of his advice most generously upon every subject, from the size of our families to the mistakes of the Federal judges, and some error is inevitable now and then to the most conservative man under such circumstances." With regard to Roosevelt's statement that the facts were not in dispute, only the inferences therefrom, the Standard Oil men agreed. "The Standard Oil Company furnished the facts and a man with a muck rake dug out such as under his manipulation he felt would prove damaging."

Not content with the public statement of Archbold and Rogers, the

directors soon issued a more comprehensive answer to the allegations in the Garfield Report. On May 16 C. M. Pratt, as secretary of Standard Oil Company (New Jersey), addressed a letter "To the Shareholders of the Standard Oil Company," in which the main charges of discrimination were taken up one by one. Pratt noted that the Commissioner had not been able to show that Standard Oil had "received a single rebate on its interstate shipments" during a period of about fifteen years over more than 200,000 miles of railways, though he had called attention "to a few instances in which the rate situation in his opinion required explanation." As spokesman for the directors, Pratt averred that it was a "palpable absurdity" to call Standard Oil a monopoly when it controlled a "very moderate percentage of the crude oil production of the United States" and when there were at least 125 competing refiners in existence. "Whatever measure of prosperity" Standard Oil had enjoyed, declared the letter, was "not traceable to illegal or reprehensible methods, but to its economic and elaborate industrial organization, covering as it does every detail of transportation, manufacture and administration." This letter also became public knowledge through the newspaper press.

Perhaps Standard Oil executives intended to minimize the impact of an anticipated action by the President of the United States. Within twenty-four hours after the issue of the Pratt letter Roosevelt sent the Garfield Report to Congress. It was timed to aid the passage of the Hepburn Bill to strengthen the Interstate Commerce Commission. In his forwarding message the President promised that the Department of Justice would consider the question of instituting prosecutions against Standard Oil in at least some of the specific instances of illegal acts cited in the Report.

The Pratt letter and the Roosevelt message to Congress set off another short-lived debate. On May 17 J. R. Garfield also took occasion to answer the defensive allegations of Standard Oil by reiterating the validity of several of the assertions in the now famous Report. Two days later the vice-president of the New York Central Railroad issued a correction. He maintained that the rates between Olean and Vermont points were not secret but were commodity tariffs and hence not illegal.[20]

Jersey Standard's directors later drew another, though not very effective, arrow from their quiver. They published the hearings held during the preparation of the Report. When investigation had been nearly completed, Garfield asked the Jersey Company to present a man to comment upon various facts discovered. H. E. Felton, the head of the combination's

traffic department, answered almost all the questions in the hearings, though his predecessor, Howard Page, also appeared briefly. Felton gave historical explanations in all instances when he had the knowledge. For example, he pointed out that the low railroad rate between Olean and Rochester grew out of the threat by Standard Oil to build a pipeline between the two points in the early eighties. With regard to the favorable rates out of Whiting, he stated that in the Central Freight Association area, established immediately after the passage of the Interstate Commerce Act of 1887, railroad managers had set rates designed to maximize revenues on shipments out of Chicago. The railways always had to consider potential competition from the Mississippi River on traffic to the South. He cited the fact that Standard Oil plants at Pittsburgh, Franklin, and Buffalo shipped thousands of carloads of kerosene, gasoline, and lubricating oil annually westward at exactly the same rates as other refiners in the Appalachian region. Since writers of the Garfield Report merely generalized about Felton's points, played down the importance of investments in pipelines and of strategic location of plants, and entirely omitted mention of rate advantages enjoyed by independent refiners at many points, Standard Oil published and widely distributed a full transcript of the hearings.[21] In that form it could not win a large reading public.

In point of fact, Commissioner Garfield was stating principles which had not yet been upheld as law by the courts.[22] Archbold, Rogers, and Pratt were insisting that their organization had consistently obeyed the law up to that time. In one of his comments regarding rates in Central Freight Association territory, Garfield remarked: "It is difficult to avoid the conclusion that the present rate adjustment on oil into this territory is due to the ability of the Standard Oil Company to dictate the policy of the railroads, both east and west, in such manner as to compel discrimination in its favor."[23] In the two major cases brought by the Department of Justice against Indiana Standard the company was vindicated and the government case collapsed. The point is—Standard Oil men thought they were obeying the law and were, according to subsequent court decisions, correct in their interpretation in the key area, though not in New York.

Notwithstanding Standard Oil's protests, the company endured a veritable barrage of attack during the last seven months of 1906. Under a resolution passed by Congress in February, the Interstate Commerce Commission was engaged throughout the year in probing the behavior

of Standard Oil and its competitors with reference to railroads and pipelines, all hostile criticism being reported fully in the newspapers. The Hepburn Bill, which became law in June, gave the Commission power, upon complaint, to set maximum rates and to establish through rates when carriers refused to do so. Although the Act recognized the right of judicial review of the Commission's decisions, it made them binding until ruled upon by the courts. It also brought oil pipelines, along with express companies and sleeping-car companies, under the jurisdiction of the Commission.

The threat that the Hepburn Act would embrace pipeline regulation induced Standard Oil to have all properties of its pipeline companies in the East terminate at state boundaries. Jersey Standard, for example, bought all the combination's pipelines within the states of New Jersey and Maryland during 1906 with the idea of maintaining that, since the oil was delivered at the borders, there was no interstate commerce. Standard Oil management had no intention of admitting without a fight that pipelines built on purchased rights of way and carrying oil belonging exclusively to units of the organization were in actuality common carriers. Inasmuch as The Ohio Oil Company and The Prairie Oil & Gas Company took into their pipelines only petroleum which they had already bought, their cases were stronger than that of the lines further east. Pure Oil, Gulf, Texas, and other corporations engaged in transporting oil joined Standard Oil in the contention that pipelines were private property, not public service units, engaged in transporting petroleum. Not until 1914 in the Pipe Line cases did the Supreme Court uphold the constitutionality of the regulation of pipelines in interstate commerce.

Federal legislation and investigation stimulated and reflected widespread activity in the states. Politicians had a field day catering to the convictions of the electorate about Standard Oil. As Table 52 shows, several attorneys general had initiated suits against Standard Oil units prior to May 2, 1906, the date of the Garfield Report, but litigation took a definite spurt after that point. Noteworthy was the new suit of the State of Kansas against the Standard Oil Company (Indiana), The Standard Oil Company (Kansas), and The Prairie Oil & Gas Company. Several state cases, especially those in Tennessee, Texas, and Missouri, later attained major importance.

Between May and December, 1906, federal grand juries sought data justifying indictments of Standard Oil companies in California, Louisiana, Missouri, Tennessee, Illinois, and New York. By the middle of November the Department of Justice had inaugurated two suits against Indiana

Table 52 PARTIAL LIST OF STATE SUITS INVOLVING STANDARD OIL COMPANIES, 1904-1906

Date	*Title*[a]	*Place of Initiation*[b]
Apr., 1904	*Tenn.* v. *Standard Oil Co. (Ky.)*	C. C. of Sumner Co.
Sept., 1904	*Ill.* v. *Standard Oil Co. (Ky.)*	C. C. of Macon Co.
Oct., 1904	*Ky.* v. *Standard Oil Co. (Ky.)*	Co. C. of Jefferson Co.
Mar., 1905	*Kan.* v. *The Standard Oil Co. (Kan.) et al.*	S. C. of Kan.
Mar., 1905	*Mo.* v. *Standard Oil Co. (Ind.), Republic Oil Co., and Waters-Pierce Oil Co.*	S. C. of Mo.
June, 1905	*Ky.* v. *The West India Oil Refining Co.*	Co. C. of Jefferson Co.
Oct., 1905	*W. Va.* v. *South Penn Oil Co.*	C. C. of Marion Co.
Mar., 1906	*Ky.* v. *Standard Oil Co. (Ky.)*	Co. C. of Jefferson Co.
May, 1906	*Ohio* v. *The Standard Oil Co. (Ohio), The Solar Refining Co., The Ohio Oil Co., The Buckeye Pipe Line Co., et al.*	C. C. of Lucas Co.
June, 1906	*Ohio* v. *The Buckeye Pipe Line Co., John O'Brien et al.*	P. C. of Hancock Co.
July, 1906	*Ohio* v. *The Standard Oil Co. (Ohio), J. D. Rockefeller et al.*	P. C. of Hancock Co.
July, 1906	*Ark.* v. *Waters-Pierce Oil Co.*	C. C. of Pulaski Co.
Sept., 1906	*Maryland* v. *Standard Oil Co. (N. J.)*	City C. of Baltimore
Oct., 1906	*Texas* v. *Waters-Pierce Oil Co.*	D. C. of Travis Co.
Nov., 1906	*Okla.* v. *Waters-Pierce Oil Co.*	D. C. of Kingfisher Co.
Nov., 1906	*Kan.* v. *Standard Oil Co. (Ind.), The Standard Oil Co. (Kan.), The Prairie Oil & Gas Co.*	S. C. of Kan.
Nov., 1906	*Ohio* v. *The Buckeye Pipe Line Co.*	C. C. of Allen Co.
Nov., 1906	*Ohio* v. *The Solar Refining Co.*	C. C. of Allen Co.
Nov., 1906	*Ohio* v. *The Ohio Oil Co.*	C. C. of Allen Co.
Nov., 1906	*Ohio* v. *The Standard Oil Co. (Ohio), J. D. Rockefeller et al.*	C. C. of Hancock Co.
Nov., 1906	*Ohio* v. *The Buckeye Pipe Line Co.*	C. C. of Hancock Co.

[a] To save space the name of the state has been utilized instead of the conventional method, as in *State* v. *Standard Oil Co. (Ky.)*
[b] Abbreviations used under this heading are as follows: C. C. for Circuit Court, Co. C. for County Court, P. C. for Probate Court, D. C. for District Court, S. C. for Supreme Court.
Source: SONJ, Dockets 12 and 13.

Standard for illegally taking rebates on storage charges from the Lake Shore & Michigan Southern Railroad, a suit for accepting unlawful concessions on shipments between Whiting and East St. Louis, and another on similar charges involving traffic between Whiting and Grand Junction, Tennessee. During the same period New York Standard, Vacuum, the New York Central, and the Pennsylvania Railroad were indicted at Jamestown, New York, for receiving and giving secret, illegal

rates on petroleum products transported from Olean and Buffalo to Vermont points. These became the criminal cases of outstanding significance in the national attack on Standard Oil.

The cases in state and federal courts were but preliminary barrages for the principal attack. On November 15, in the United States Circuit Court for the Eastern District of Missouri at St. Louis, the federal government filed a bill in equity against the Standard Oil Company (New Jersey), John D. Rockefeller, six other directors, and the various corporations and partnerships in the combination. In their bill the federal lawyers reviewed the history of Standard Oil from the 1870's onward and asked the court to adjudge it a monopoly and conspiracy in restraint of trade under the definition of the Sherman Antitrust Act. In the exact legal terminology, they prayed that the "defendants and the Standard Oil Company of New Jersey be enjoined, restrained and prohibited from exercising any control over said corporations, or any of them, by the election or appointment of directors, officers, agents, or servants, or in any other manner, and that said defendant corporations be enjoined and prohibited from declaring or paying any dividends to the said Standard Oil Company of New Jersey or to any person or corporation for the said Standard Oil Company." If the court should acquiesce fully in the petition of the prosecution, Jersey Standard would be stripped of all its stock holdings and each affiliate would attain complete independence.

Standard Oil executives really stood with their backs to the wall. Not only was the combination facing dismemberment, but individual units were before the bar of federal justice at Jamestown, New York, Chicago, Illinois, and Jackson, Tennessee. Corporate members were engaged in running battles with the states of Kentucky, Tennessee, Kansas, Missouri, West Virginia, Connecticut, Ohio, Arkansas, Maryland, Texas, and Oklahoma. Federal and state authorities worked out a loose co-ordination of the entire campaign. All federal cases except those involving the Lake Shore Railroad flowed from evidence adduced in the Garfield Report. Prosecuting attorneys and attorneys general of the states flitted from state to state and to Washington, D.C., listening, conferring, and collecting data pertinent to their own local struggles with the embattled giant of the petroleum industry.[24]

FIGHTING A LOSING BATTLE

Jersey Standard's executives faced an almost impossible task in striving to stave off the multitudinous attacks. A large and articulate segment

of public opinion was thoroughly aroused against the combination. Governmental servants from Roosevelt to county prosecuting attorneys furnished the newspapers with their intentions and beliefs as well as allegations and facts from investigations, actions of grand juries, and indictments. Rarely did a Standard Oil reply get equal space or prominence.[25] Readers avidly followed every move of both adversaries in the greatest legal tussle to that date in the industrial history of the Republic. The copy was voluminous, though scarcely enlightening at times. The struggle dragged on for four and one-half years, the first phase ending with the decision in the District Court for the Eastern Judicial District of Missouri in November, 1909. The focus of the conflict was the federal suit for the dismemberment of Jersey Standard, but there were legal skirmishes going on throughout the nation.

Both parties to the dissolution suit assembled a formidable battery of legal talent. To try the case the Department of Justice engaged two outside lawyers. It hired Charles B. Morrison, federal District Attorney in the Northern District of Illinois, and Frank B. Kellogg, a St. Paul attorney who forged a reputation in this case which aided in carrying him ultimately to the Secretaryship of State. In constructing the briefs these two were aided by Attorney General C. J. Bonaparte and three other members of the bar. Jersey Standard's special counsel to handle the defense were John G. Milburn of the New York firm of Carter, Ledyard and Milburn, D. T. Watson of Pittsburgh, Moritz Rosenthal of Chicago, and John G. Johnson of Philadelphia. Nine others, including M. F. Elliott and Martin Carey of the holding company's regular staff, contributed assistance on the briefs. When to these were added all the prosecuting attorneys, attorneys general, and attorneys for the plaintiffs and for the defendants in all the Standard Oil cases in state, county, and federal jurisdictions throughout the United States, it becomes apparent that the giant combination was indeed a boon to the legal profession. The lawyers had struck oil.

Before the lawyers swung into action, Archbold and his associates sought to match government publicity with moves of their own. On November 15, 1906, the same day that the bill was filed in St. Louis, they issued a public announcement "To the Shareholders of the Standard Oil Company" over the signature of C. M. Pratt, Secretary. The directors expressed the conviction that the position of the company was "unassailable from both a legal and a moral standpoint" and voiced confidence that in the suit the company would "successfully maintain its position upon the

merits and vindicate it before the public and the law." They asserted that the legal organization of Jersey Standard was of "essentially the same nature and character as that of the other important industrial interests of the country," and that the "continuous growth and expansion of its business" had been "legitimate and normal." Their beliefs were based upon the premise that the existing organization had been "formed after an exhaustive consideration of the legal and business problems involved" and that everything relating to its operations had been "a matter of public report." The letter declared that "at every step the utmost care" had been "observed to conduct the business honestly and fairly, and in accordance with not only the spirit but the technical requirements of the law." Though the directors felt that there was no adequate reason for the suit, they thought it "perhaps better" for the interests of stockholders "and the business interests of the country that the controversy should be removed to the judicial atmosphere of the courts—in whose integrity and wisdom every citizen should have the fullest confidence—where mere allegation must give way to legal proof."

During the first six months after the filing of the dissolution suit little was accomplished beyond setting some of the limits of the combat. Attorneys for the defendants filed a series of exceptions and answers.

Milburn and his aides sought to eliminate thirty-three defendants from the case and to set 1899 as the date behind which evidence would not be relevant. Seven natural gas companies, which were named in the government's petition in spite of the fact that they had been transferred to the Natural Gas Trust in 1888, denied that they had entered a conspiracy in restraint of trade in petroleum and its products. Since they dealt in natural gas alone, their contention was later acknowledged as valid. Nine other natural gas companies, whose shares were owned either by National Transit or Jersey Standard, made a similar statement with identical results.[26] It was also contended that Jersey Standard either had a minority interest or none at all in The Manhattan Oil Company, the Security Oil Company, the Folger-Payne partnership (Corsicana Refining Company), the Florence Oil & Refining Company, the United Oil Company, Platt & Washburn Refining Company, The Tide-Water Pipe Company, Limited, and Tide Water Oil Company. Other exceptions pointed to the fact that nine of the companies designated in the government's bill were dead. In drawing up the indictment Kellogg had relied on the Garfield Report and was only later aware of its inaccuracies. Jersey Standard attorneys also consistently maintained through-

out the case that, in spite of owning a majority of the shares, the parent company did not exercise control over the Waters-Pierce Oil Company. In addition, lawyers for the defendants contended that all parts of the government petition alleging conspiracy prior to the time that Jersey Standard became the parent company in 1899 were not pertinent.[27]

Defending attorneys also made two "answers to the petition." The first answer of Jersey Standard, the seven individuals involved, and thirty-five companies[28] included a series of admissions of fact and a blanket denial of a conspiracy in restraint of trade after 1899. At the request of the court an "additional answer," subsequently filed by the same defendants without waiving their objections to the inclusion of data before 1899, contained a wide range of admitted facts and denials of averments in the government petition covering the period from 1870 to 1899.

Before Franklin Ferriss, the special examiner, had begun to hear testimony, other state and federal agencies—the Interstate Commerce Commission, the Bureau of Corporations, and the courts—fired their guns at point-blank range against the Jersey Standard family. By interspersing blasts from these units with initial moves at St. Louis, the Department of Justice succeeded in keeping the eyes of the public upon the proclaimed misdemeanors of the alleged illegal combination. Simultaneously, the released data and court decisions supplied new leads and new factual ammunition for the prosecuting counsel.

The first salvo came in January, 1907. The Interstate Commerce Commission reported its findings of the preceding year. Not only had the Standard Oil pipelines failed to conduct themselves as common carriers under laws of the states, so ran the report, but they were also systematically defying the Hepburn Act passed in June, 1906. Furthermore, the commissioners reiterated, as conclusions derived from testimony before them, that the combination accepted secret railroad rates, spied upon competing marketers, set up "bogus" marketing companies, and engaged in unfair local price cutting.[29]

On May 20, 1907, Herbert Knox Smith, successor to J. R. Garfield as Commissioner of the Bureau of Corporations, issued the second installment of the report on the petroleum industry in the United States. Significantly, it was subtitled the "Position of the Standard Oil Company in the Petroleum Industry." The document contained data permitting the Commissioner to assert that the history of the company showed throughout "the past thirty-five years a substantial monopolization of the petro-

leum industry of the country, a deliberate destruction of competition, and a consequent control of that industry by less than a dozen men," who had "reaped enormous profits therefrom." Commissioner Smith admitted that the "commercial efficiency" of Standard Oil administration was "very great." Yet he insisted that it had been "consistently directed, not at reducing prices to the public, and thus maintaining its predominant position through superior service, but rather at crippling existing rivals and preventing the rise of new ones by vexatious and oppressive attacks upon them, and by securing for itself most unfair and wide-reaching discriminations in transporting facilities and rates, both by railroad and by pipeline, while refusing such facilities so far as possible to all competitors."[30]

To make his case as strong as possible the Commissioner included in his analysis of the combination the facilities of all companies, except the Pure Oil group, in which Standard Oil units held a minority interest. As evidence of the monopoly in petroleum products, the report stated that the combination produced one-sixth of all petroleum extracted during 1904 in the United States, almost completely controlled all pipelines in and from the more important fields, consumed 84.2 per cent of all the crude oil used, manufactured 86.5 per cent of the illuminating oil, handled 87 per cent of the kerosene exported, and marketed 88.7 per cent of that product which entered in domestic trade.[31]

The conclusion of the Commissioner was pointed, indeed. Only by railroad discrimination, abuse of control of pipelines, and unfair methods of selling products had Standard Oil "been able to maintain its monopoly while charging prices averaging much above the competitive level."[32]

Almost immediately several occurrences in legal entanglements piled up factual substantiation of Standard Oil misbehavior. On May 24, 1907, the special commissioner in the case of Missouri against Indiana Standard, Republic Oil, and Waters-Pierce initiated in March, 1905, filed findings of fact with the Supreme Court of that state. Citing many misdemeanors in marketing, he indicated that the three companies were guilty of a conspiracy in restraint of trade and had violated antitrust laws of Missouri.[33] Although the decision of the judges did not come for more than a year, the commissioner's report was widely disseminated in the press. Meanwhile, on June 1, 1907, the Waters-Pierce Oil Company had been convicted of violating the antitrust laws of Texas as a consequence of its connection with Jersey Standard, a trust. The District Court of Travis County fined the foreign corporation $1,623,000 and ordered it to cease

operations in the state.[34] As steps were being taken to appeal this case to a higher court, Judge Kenesaw Mountain Landis decided on August 3 that Indiana Standard had violated the Elkins Act on shipments from Whiting to East St. Louis.[35] The jurist then imposed the maximum fine for every car transported over a designated period, which produced a total of $29,240,000.

Forty-eight hours after the Landis decision, Commissioner Smith released the conclusions of the Bureau of Corporations on prices and profits in the petroleum industry. Possibly timed for maximum impact upon the reading public, the report encompassed 965 pages of statistics and analyses of them. Most of the data involved Standard Oil units, though the behavior of competitors came in for brief attention. The report stated that Standard Oil had set the prices in the petroleum industry for twenty-five years, that flagrant discriminations in prices had been practiced, that profits were exorbitantly high (especially since 1896), and that the price policy of the combination had "apparently been to sacrifice the interests of the American consumer for the purpose of securing" foreign business. Prices received by Galena-Signal were subjected to special castigation. The Commissioner denied the oft-heard claims of Standard Oil men that the combination had reduced the price of oil, that it had been a benefit to the consumer, and that only such a great aggregation of capital and facilities could have "furnished oil at the prices that have prevailed."[36]

As the culmination of the campaign of governmental attack lasting more than a year, the Landis decision and the issuance of "Prices and Profits" wrung a public reply from Standard Oil. In a pamphlet addressed to employees and stockholders, Jersey Standard directors asserted their "desire to emphasize for the half million of people directly interested in its welfare the assurance of the Company's absolute innocence of wrongdoing in any of the prosecutions lately instituted against it in the Federal Courts." They pointed out that the decision of Judge Landis had been appealed to a higher court, where it was hoped that "calm judgment" would "rescue the rights of the citizen from the field of public clamor and from the domain of vindictive politics." They expressed the opinion that, "so persistent and adroit" had been the "warfare waged with all the overpowering authority of the Federal Administration against the Standard Oil Company," it had been "manifestly difficult to get a fair hearing before the public or in a large portion of the press, the latter, to its great harm, swayed alike by socialistic outcry from below and

political pressure from above." Then followed an analysis of the timing of the various reports from the Commissioners of the Bureau of Corporations. The directors felt that such attacks were "aimed at the nation's industrial and mercantile life," especially when, as they declared, Commissioner Smith's first report was "illogical and partisan" and his second "a wholly false deduction from incomplete facts." To prove that other views were tenable, Standard Oil leaders included in their pamphlet a statement of Indiana Standard's arguments in the Whiting–East St. Louis case and twenty-nine editorials from twenty-seven different newspapers and periodicals. *The World* headlined its report on the pamphlet: "Standard Oil Whimpers; Says It's a Victim."[37]

It cannot be doubted that Standard Oil had some arguments in its favor. Within six months Judge Grosscup was to return the Whiting–East St. Louis rate case for retrial on the ground that the conduct of Judge Landis had been most injudicious. That the federal government had waged a well-timed publicity campaign was self-evident. And careful examination of the report on "Prices and Profits" would reveal to any impartial investigator that it was indeed a mixture of objectivity and bias, of use and abuse of statistics, of established fact and strained interpretation. Perhaps the most forthright analysis of the report appeared in *The New York Times* of August 5, 1907. The editorial writer for that newspaper stated as the "evident truth" that the Standard Oil combination had been "efficient" and that "some of the best business brains in the world" had "labored in its service." He maintained that the price tables and diagrams, not only in the reports of the Bureau of Corporations, but in Tarbell's *History,* seemed to show, "when interpreted in an unbiased way," that had "normal competition" held sway during the preceding twenty-five years "the price paid by consumers in this country for illuminating oil would now be much higher than the actual quoted prices." Even granting that the combination had made "persistent use of the worst industrial methods," the writer remained convinced that the conclusions of the report on "Prices and Profits" were "in many substantial respects unreasonable, unfair, and not sustained by the evidence."

Standard Oil executives chose well both topics and time for public defense of their position. In August, 1907, they stood on solid ground with reference to many of the allegations and arguments in the reports by the Bureau of Corporations and to the decision by Judge Landis. Although the future could not be foreseen, various constituent companies

did not fare at all well in many state courts at a later date, a development elucidated in other parts of this chapter. The prosecution had just unlimbered its big guns.

After several postponements, hearings in the federal suit against Jersey Standard began on September 17, 1907. They were conducted by Special Examiner Franklin Ferriss. Over a period of more than fifteen months he heard testimony in New York, Washington, Chicago, Cleveland, and St. Louis. Witnesses for the plaintiff appeared first, then in May, 1908, those for the defense, followed by rebuttal witnesses for the government in January, 1909. All told, over four hundred individuals testified. The record of the testimony and exhibits alone filled approximately twelve thousand printed pages in twenty-one volumes. It was by far the most comprehensive body of information collected in any federal antitrust suit up to that time.

The prosecution's witnesses, chiefly former employees and competitors of Standard Oil, rang the changes on all charges against the much-vilified organization. Almost all the familiar figures appeared on the stand—Emery, Monnett, and others—plus scores of lesser lights who had recently testified in federal, state, and county suits. Kellogg and Morrison spent little time building up information on crude oil production by Standard Oil units; the combination had never approached a monopoly position in that function, having passed the peak of its share in national operations with 33.5 per cent as early as 1898. Government witnesses did establish beyond cavil, however, that Standard Oil dominated the buying and transportation of raw petroleum east of the Rockies. Counsel for the government pounded that point home repeatedly. They elicited evidence indicating that the prices paid to producers were arbitrarily set at 26 Broadway and that Standard Oil pipelines had failed to behave as common carriers by setting unreasonably high minima for shipments by producers and by refusing to deliver batches to independent refiners upon request. Many witnesses contributed to the contention that Standard Oil rates for collecting, storing, and transporting petroleum were far too high. Though manufacturing was given relatively slight attention, Emery and others put into the records their opinion that Standard Oil had achieved no advantage in that field through mass-production techniques.

Testimony pro and con regarding the "unfair" competitive methods of Standard Oil marketers pre-empted over half the space in the record, much of it presented by witnesses for the prosecution. Though they made no new types of allegations, they did provide new data to support the

kinds of accusations made by many individuals since 1874. The major elements of "unfair competition" by Standard Oil marketing units were said to be local price cutting, reporting on competitors' shipments, operation of "bogus" or hidden companies, and rebates to favored buyers. None of these per se was illegal at the time. According to witnesses, miscellaneous indications of unethical conduct by the combination were numerous, ranging from following competitors' tank wagons to using threats as a means of inducing buyers to countermand orders for competing oil.

The best-known and most impressive testimony for the prosecution dealt with prices and profits. By adroit questioning of witnesses Kellogg and Morrison built up support for their major contentions. These were:

(1) That Standard Oil prices for kerosene varied widely from one area to another;
(2) that its prices were lower where competition was present and active than where competition was inactive or ineffective;
(3) that in the absence of competition prices had been exorbitant and unreasonably high;
(4) that in many competitive instances Standard Oil marketers cut prices below cost;
(5) that in many cases by such methods the defendants either limited independent business to small territory and small amounts or drove competitors out and destroyed their business, after which prices were immediately raised;
(6) that by such tactics all over the United States competition to Standard Oil had been substantially destroyed and limited to less than 10 per cent of total sales of petroleum and its products; and
(7) that there had been an unreasonable advance in the average prices charged by the combination from 1895 to 1906, inclusive, a fact to which E. D. Durand, deputy commissioner of the Bureau of Corporations, testified.

The above measures, in the opinion of the prosecution, were manifestations of a monopoly which was responsible for enormous and unreasonable profits. These amounted to more than $700,000,000 on an initial capital of less than $70,000,000, during the twenty-four years from January 1, 1882, to December 31, 1905.

To counter the efforts of government counsel Milburn and his colleagues

sought to impress an entirely different picture upon the court. They tried to substantiate the contention that the Standard Oil organization had never been a monopoly and had never restrained trade in petroleum or its products.[38]

The courtroom behavior of Standard Oil counsel was typical of lawyers in similar situations. Milburn and Rosenthal raised objections every time evidence was introduced on the period before 1899 and especially on the years prior to the passage of the Sherman Antitrust Act. The examiner interpreted the rules of relevancy very leniently, however, thus failing to sustain the majority of the objections of the defense. In cross-examination defending lawyers forced government witnesses to admit that their testimony was hearsay on numerous occasions. In several instances other witnesses were compelled to admit that they had been discharged by Standard Oil units for misappropriation of funds or for engaging in practices contrary to the policies and orders of their managers.

In testimony far too extensive for reproduction at this point, high-ranking executives and many lesser figures in the Standard Oil family gave their version of the facts on a host of topics raised by the prosecution. John D. Rockefeller, H. M. Flagler, and John D. Archbold bore the brunt of questioning on the origin and corporate development of the combination to 1900. They and others gave detailed explanations of the causes, content, and interpretation of all major controversial contractual agreements in the seventies and eighties. Witnesses of high and low estate expounded the economics and technicalities of pipeline construction and operation in a determined justification of Standard Oil actions. Others denied emphatically, and with numerous reasoned arguments, that Standard Oil executives had ever concluded any contracts in restraint of trade.

As to alleged unfair methods of competition in marketing, defense witnesses presented an imposing body of contravening fact. Milburn and his colleagues persistently attacked hostile testimony for its incompetency and hearsay character. From one to thirty witnesses came forward to answer each individual charge of the opposition. In almost every instance of price cutting the defense developed evidence to show that the slow-moving oil giant had lowered prices only after a competitor had initiated the campaign. In other cases witnesses for the company testified that reductions, thought by small competitors to be directed against them, were in reality a lowering of prices over a large area. Standard Oil counsel later forcefully pointed out that prosecution lawyers could hardly

maintain that local price cutting was a general policy of the combination when they had been able to allege such behavior in only 37 towns, while the defendants as a group were selling petroleum products in 37,000 towns throughout the United States.[39] Executives and employees of Standard Oil marketing units freely admitted the operation of alleged hidden companies, gave reasons for their utilization, pointed to competitors using the same technique, upheld its legality, and stated that the organization had abandoned the practice in the United States. Defense counsel made no effort to disprove that overzealous employees did on occasion act contrary to orders of Standard Oil managers but maintained that all the voluminous evidence on unfair competitive methods could only be classed "as incidents in the conduct of a great business" and could not possibly be inferred to prove that the defendants intended to monopolize trade in petroleum products.[40]

Allegations of unfair, secret, and illegal railroad freight discriminations were subjected to the same minute exposition and refutation as other charges by the prosecution. Rockefeller, Flagler, and others maintained that Standard Oil had always given a *quid pro quo* for concessions received in the early days of the industry, that rebating was universal rather than confined to Standard Oil, that competitors on occasion had been granted as large concessions as the oil combination, that rebating was not illegal until 1887, and that Standard Oil had taken no rebates since that date. Other executives testified as to the legitimacy of rates in every sector mentioned in the Garfield Report and later raised in the dismemberment suit.

One witness after another contributed to the support of the contention that Standard Oil had not oppressed or crushed competition by any of the methods alleged. Many competitors on the stand were forced to admit under cross-examination that their business had grown larger and stronger instead of smaller and weaker. Statistical tables drawn from the private records of Jersey Standard itself showed that the proportion of the combination in producing, transporting, manufacturing, and marketing of petroleum and its derivatives had reached peaks in the 1890's and had declined thereafter. Archbold and others furnished lists to prove the increase in the number of competitors between the late nineties and 1907, not only in Kansas, Oklahoma, Texas, and California, but also in the Illinois, Kentucky, Lima-Indiana, and Eastern fields, not to mention about four hundred foreign competitors in markets abroad.

One noteworthy exception was consistently made in all these defense

measures by Standard Oil counsel. They always ignored evidence on the activities of the Waters-Pierce Oil Company, on the ground that the minority holders had managed that corporation ever since its inception. The court disregarded this attitude of Milburn and associates. Testimony on Waters-Pierce misdemeanors went into the record *in extenso*.

Defending witnesses and counsel interpreted evidence introduced by the government from Standard Oil records as proving that the combination had not earned unreasonable profits. While kerosene, the product emphasized by the prosecution, grew 22.14 per cent in volume from 1895 to 1906, the volume of by-products was increasing 112.84 per cent, with commensurate changes in the allocation of earnings from the two categories of products. At the same time, witnesses for Standard Oil contended that net earnings should not be calculated on the original net assets of the Trust, as the government had done. In the brief for the defendants on the facts it was maintained that, to be fair, the government should take account of the cumulative effect of compound interest. Calculations revealed that the annual addition of merely 7 per cent to capital for its use, starting with the original capital of $70,000,000, would yield by December 31, 1906, a total of $355,065,687, a figure only slightly less than the $359,400,193 actually shown on the books as the net assets of Jersey Standard at that time.[41] To Milburn and his associates these data, and others, proved conclusively that Standard Oil profits had been and were reasonable.

Furthermore, defense counsel, with the aid of witnesses and many statistical data, insisted that Standard Oil had not increased prices unreasonably between 1895 and 1906, as Kellogg and Morrison, aided by Durand, averred. To support this contention Standard Oil had recourse to comparison of petroleum prices with the index numbers of wholesale prices published by the Bureau of Labor in the *Bulletin* for March, 1908. These were interpreted for the defense by Joseph French Johnson, Professor of Political Economy and Dean of the School of Commerce of New York University. According to him, the Standard Oil price for Water White kerosene to dealers, exclusive of transportation and handling charges, had risen much less than the average price of the 258 commodities on the Bureau of Labor list.[42] The defense declared that the combination had raised its prices reasonably in relation to costs, including that of crude oil.

While prosecution and defense laboriously assembled evidence to support their conflicting contentions, every event in other state and

federal courts was watched with fear and misgiving at 26 Broadway. The tide of legal opinion seemed to be running against Standard Oil, particularly in the South, though members of the family suffered setbacks also in other sectors of the nation. Only one affiliate succeeded in staving off most of the attacks.

In December, 1908, the Missouri Supreme Court decreed that Indiana Standard, the Republic Oil Company, and Waters-Pierce had violated the antitrust laws of the state and should forfeit their charters or licenses. No sooner had the implications of the court action become apparent to the people of the state and to neighboring producers than they, as well as Indiana Standard, began hunting for a legal means of keeping both the marketing organization and the Sugar Creek Refinery in operation. The public was willing to read editorials opposing the "monopolies," but it did not want to lose a going concern. When attempts at immediate solution failed, Indiana Standard took its case to the Supreme Court of the United States. Waters-Pierce conformed to the stipulations of the Missouri court to operate as an independent concern and continued in business.[43]

Neither Waters-Pierce nor Jersey Standard fared so well in Texas as in Missouri. In fact, Texas threw all Standard Oil units out of the state in 1909. In January the Supreme Court of the United States confirmed the decision of the Texas courts that Waters-Pierce, through its own behavior and through the ownership of a majority of its stock by a trust (Jersey Standard), had violated the antitrust laws of the state and should forfeit its right to operate therein.[44] For the latter reason alone, on October 26 a district court also decreed the ouster of the Security Oil Company, the Navarro Refining Company (formerly Corsicana Refining Company) belonging to the Payne-Folger partnership, and the Union Tank Line Company.[45] Four years later Jersey Standard acknowledged its relationship with the three jointly ousted firms up to the date of the decision. Though the Jersey Company paid a fine of $500,000, the terms of the consent decree did not forbid the company from thereafter conducting business in Texas. While Jersey Standard itself has not entered Texas, it has, through purchase of stock, acquired an interest in a locally chartered company.[46]

The situation at the end of the first decade of the century seemed as gloomy to Standard Oil men elsewhere as in Texas. Waters-Pierce was before the bar in Arkansas for breaking that state's uniform price law. Only the intervention of Elliott with the counsel of Waters-Pierce per-

suaded the company momentarily to adjust its prices in Oklahoma as a means of avoiding a similar indictment there.[47] Although Kansas had dropped its first suit against Kansas Standard, the case of the state against that company, Indiana Standard, and Prairie Oil & Gas (see Table 52) remained a continuous cause of uncertainty. In April, 1908, the Supreme Court of Tennessee decreed the ouster of Kentucky Standard on the ground that, since salesmen had given oil to dealers at Gallatin in order to induce them to countermand orders for competing oil, the company had violated the antitrust law of the state. Neither the public nor Kellogg and Morrison forgot the implications of the conviction, later upheld by the Supreme Court of the United States.[48]

Only one star shone brightly for the Standard Oil family. On March 10, 1909, the Landis decision was reversed in District Court for the Northern District of Illinois, and the Standard Oil Company (Indiana) was declared not guilty of violating the Elkins Act.[49] The case of the Department of Justice against Indiana Standard regarding shipments via Grand Junction was still pending, but it was also proceeding favorably for the corporation. These developments were exceptions to the rule.

In the dissolution suit at St. Louis, Judges Sanborn, Van Devanter, Adams, and Hook finally on November 20, 1909, dispelled the worries of Frank B. Kellogg[50] and sustained the fears of Standard Oil men. The judges rendered a unanimous decision quite in accord with the anti-Standard Oil trend in the majority of cases. They dismissed the bill against thirty-three companies which had not been proved to have engaged in carrying out a combination in restraint of trade in petroleum and its products. In the dismissed group, sixteen were natural gas companies and ten had ceased to exist before the complaint was filed. Standard Oil either had a minority interest or none at all in the remaining seven. At the same time, the justices held that Jersey Standard, the seven designated individuals, and thirty-seven subsidiary corporations had entered into an unlawful conspiracy in restraint of trade and had secured an illegal monopoly of a substantial part of interstate and international commerce in petroleum and its derivatives.

In arriving at this conclusion the judges skipped over almost all the conflicting evidence on railroad discriminations, unfair competitive practices, and other collateral charges. They made no specific finding of intent to defraud or to compete unlawfully. They concentrated on obvious, well-established facts in support of their decision. (1) The power to "restrict competition in interstate commerce granted to the

Standard Oil Company of New Jersey by the transfer to it of the stock of the nineteen companies and of the authority to manage and operate them and the other corporations which they controlled was the absolute power to prevent competition among any of these corporations." (2) The power was "greater, more easily exercised, more effective and more durable" than that which the three thousand stockholders of the nineteen corporations previously had before the acquisition of the corporations by Jersey Standard in 1899. (3) Many of these "corporations were potentially competitive and were engaged in interstate commerce, and the necessary effect of the transfer of the stock of the nineteen companies was a direct and substantial restriction of that commerce." (4) That being the case, the power to vote the stock, to elect the officers of the subsidiary corporations, to control and operate them, and "thereby to restrict their competition in interstate and international commerce was illegally granted to" Jersey Standard in 1899. (5) Therefore, that company ever since 1899 had been unlawfully exercising that power, the seven individual defendants were dominating and directing that exercise, the subsidiary corporations were "knowingly submitting to and assisting that exercise," and all of them were "participating in the fruits of it." (6) The combination and conspiracy were the source and support of an unlawful monopoly in the interstate and international commerce in petroleum and its products, the proof being conclusive that the defendants had secured and enjoyed a "very substantial part" of that commerce.

In accordance with these conclusions the judges issued a sweeping decree. Jersey Standard, its directors, officers, agents, servants, and employees were perpetually enjoined from voting any of its stock in any of the thirty-seven guilty affiliates and "from exercising or attempting to exercise any control, direction, supervision or influence over the acts of these subsidiary companies by virtue of its holding of their stock." The latter were prohibited from paying any dividends to the Jersey Company and from permitting it to vote any of their stock. Unless the case was appealed, the decree was to take effect in thirty days.

PUBLIC RELATIONS OF STANDARD OIL, 1906-1911

While Standard Oil was actively in the public view, the general opinion held of the company gradually changed from a very critical one to greater understanding of its contributions. In part this appeared to have been attributable to a reaction against the extremes reached by the muckrakers in 1905. In some measure it was influenced by changes in Standard Oil's own public relations policy.

As recounted above, managers of the combination had long since been aware of the importance of public opinion. They had given considerable attention to relations with the press. From the late 1890's they had been increasingly frank in answering questions in investigations. Standard Oil's relations with the Jennings Advertising Agency in Ohio and Indiana, dating from 1898 and known to the public, made the combination a pioneer in one phase of the art of public relations. The efforts to get people to understand Standard Oil's point of view and problems had been stepped up in Kansas in 1904-1905, although measures to get newspaper coverage in the state had been discontinued, on Archbold's suggestion, at the start of the Garfield inquiry. Both in reply to the resulting governmental report and in subsequent letters to stockholders the company had shown a decided tendency to increase its public explanations.

Although the public relations policy of Standard Oil from 1906 to 1911 was built on earlier developments, some new important steps were taken in these years. The company increased the amount of information given to the public, not only in testimony under questioning in court but in news releases. Signalizing the new departure was the appointment, mentioned earlier, of J. I. C. Clarke to the staff of the Legal Department of Standard Oil Company (New Jersey) on May 5, 1906, the same day that the reply was made to the Garfield Report.

Standard Oil's engaging of an experienced newspaperman to meet reporters and compile releases was in line with the general development of the time. During the previous year, Ivy Ledbetter Lee, experienced as a reporter for the *New York Evening Journal* and *The New York Times* and aware of the eagerness of the public for news about Big Business, had become the Director of Information for the Pennsylvania Railroad.[51]

Although not unique, Standard Oil's move was nonetheless a significant one in the company's history and soon showed results. Clarke not only had editorial experience with the *New York Tribune*, but he also had friendly contacts with reporters and a knowledge of how to give them news which would interest them. It is difficult to trace his influence. Some of his writings appear rather flowery and dramatic to a later generation, but after he had joined the staff of Standard Oil the number of news releases increased, and a more self-conscious public relations policy was developed. The combination's activities were presented in a more factual and accurate manner by an increasingly friendly press. An extensive, illustrated article on the work of the combination, "World Wide Field of Standard Oil," which appeared in the Sunday edition of *The*

World on May 10, 1908, must have been considered a major stroke by Clarke. In contrast to the earlier bitterly critical and garbled reporting on Standard Oil by this paper, this article was an expository statement written without any slant. The confidence of the forthright Archbold in Clarke and John D. Rockefeller's own interest in the company's "newspaper department" indicate that top management and the largest stockholder were fully behind the new policy.[52]

Quite apart from contributing press releases to reporters, the company, through its own officers, sent many signed articles and letters to periodicals. In September, 1907, Archbold addressed the "Press and Public," asking them not to accept the inaccurate statements which some papers were attributing to representatives of Standard Oil. Readers were urged not to credit a report as emanating from that source unless signed by an executive official of the company or an attorney.[53]

Letters to the press from Standard Oil men, although not an innovation, appeared more frequently in the years following 1905. Usually Libby or Asche signed letters describing the company's development of, and problems in connection with, the important function of foreign marketing. They warned the public of the bad effects on foreign trade of the attacks by American newspapers and of President Roosevelt's policy, which they characterized as in marked contrast to the aid other governments accorded their national petroleum interests. Libby answered critics of price policy by pointing out that it was unreasonable to compare the jobbing or retail price of high-flash-point kerosene demanded by regulations in the United States with the wholesale export quotation for lower-flash-test oil and thereby to arrive at the conclusion that the American consumers paid a higher price than foreigners. When, as supplies of kerosene rapidly mounted in 1910, the company reduced the price of this product, it explained in the press that its purpose was to increase consumption at home and abroad.[54]

Denials of inaccurate or misleading statements in the current periodicals often came from the Secretary's Department. William P. Howe, an assistant secretary, frequently assumed this task. For example, he wrote a letter to *The New York Times* in 1906, commenting on an article which discussed three of the combination's earlier legal cases. He admitted that many suits had been brought against Standard Oil in states "where the public prosecutors advanced to the attack with massed brass bands and campaign war whoops reverberating through a press which had lashed itself into a fury of hostility to the Standard Oil Company."[55] Yet most of

the cases, he declared, had come to the same end—"dismissal, withdrawal, nolle pros, or other euphuistic equivalent of 'no case.'" The same writer denied that Standard Oil Company was keeping the Oil and Gas Well Workers' Union out of Texas, explaining that the combination owned none of the producing property in the state involved in labor conflict.[56] It was Charles T. White, still in 1955 fresh in the memory of some in the Secretary's Department, who, succeeding to Howe's position, was the spokesman in 1909 for denying the relation of Standard Oil to other industries.

Although quite willing to contradict journalists, Standard Oil was careful not to argue legal points in the newspapers.[57] On occasion, however, the company put its side of the testimony in print. Folger, with his devotion to statistical accuracy, in a letter to *The Outlook* branded as misleading the periodical's presentation of all Jersey Standard Oil's dividends as a percentage of the valuation of 1882. This comparison, the magazine's editor replied, came from the federal Attorney General. Later, when the federal government issued two thousand copies of Kellogg's brief in the equity suit, Standard Oil men printed exactly the same number of copies of its brief for distribution to college libraries and periodicals.[58]

Employees were not normally encouraged to discuss the criticism of the company with customers, but exceptions were made in practice. One E. B. Putnam, a marketer of twenty-five years' service, reported to Archbold that, living in that "hotbed" of opposition, Decatur, Illinois, he had been goaded to talk by the allegations of a disgruntled former employee. "I broke the rule and refuted his contentions and was greatly pleased to note that the trade and public believed my version instead of his," the enthusiastic employee wrote.[59] When public criticism rose in Germany, and a state monopoly was advocated, DAPG's salesmen were given information to refute the arguments of the opposition. At a later date, when the old Buffalo Lubricating Oil case was again being aired, this time by an English periodical, *Truth,* Vacuum's managers and lawyers examined the records and prepared a résumé of the case. They sent this to the general managers of marketing companies and agencies abroad, so that they might have knowledge of the facts. However, the marketers were instructed not to make a general effort to talk about the matter with customers, who were buying oil, not political discussion.[60]

The managers of Standard Oil Company did more than merely answer allegations. Starting in 1906 they gave a great number of interviews

and put their names to an increasing number of periodical articles describing the company's work. Rogers was very pleased with his interview in 1906 with *The New York Times*,[61] a paper which, although it preserved its accustomed calm and moderate tone, was usually not uncritical of Standard Oil. Archbold appeared as an author in a wide variety of periodicals from the *Advocate* to *The Saturday Evening Post*.

"The Standard Oil Company," which appeared in the December 7, 1907, issue of *The Saturday Evening Post*, created considerable response. The article had a wide circulation and was reprinted in periodicals as different as the *Philadelphia Evening Post* and *The South African Trade Journal and Shipping Gazette*. This factual account describing the activities and contributions of Standard Oil brought a large number of letters to the author from employees, businessmen, lawyers, stockholders, and producers. They approved of the company's decision to give "a reasonable and business like publicity to its affairs," expressed pleasure at the comprehensive and convincing presentation of the facts, and characterized the article as a "revelation in the science of business administration." One writer commented that such information was bound to have a beneficial effect on the country as a whole, as well as on the company, in a period when the catchword, "restraint of trade," was applied to Big Business but not to the restraint embodied in "ignorant and intemperate attacks upon American industries."[62]

A more ambitious plan to put Standard Oil's story before the public had been inaugurated in 1906. The managers of the company decided to have its history written. A special committee, headed by F. Q. Barstow, who knew so much of the combination's life from personal experience, selected Leonard Woolsey Bacon, a minister, to carry out the work. John D. Rockefeller himself commented that the project deserved "first class talent. . . . The best that can be secured is not too good for this important writing."[63] The older men in the combination contributed to the manuscript: that astute compiler of memoranda, W. H. Libby, made suggestions; Flagler penned some concise statements of fact, based on his early knowledge of the industry; and Rockefeller looked over the parts of the manuscript submitted to him, and, in the interest of accuracy, made suggestions for changes in the fifth chapter. This part of the book, printed under the author's name in pamphlet form as the *History of the South Improvement Company*, is the only portion of the work now known to be available. The Reverend Bacon's illness in the spring of 1907, followed by Barstow's retirement and death, put an end to this project.

Although the history project did not reach completion, some personal recollections of the early days of Standard Oil were recorded by John D. Rockefeller. With a few exceptions, he had been silent, in contrast to the more vocal policy of the active managers of Standard Oil in answering allegations. In 1905 he expressed himself as believing that when history was "correctly recorded," it would be what he had done rather than what he had said which would be important.[64] In the same year, however, he was thoroughly aroused by Washington Gladden's characterization of gifts to the church as "tainted money" and by the extremely bitter articles of Ida Tarbell which reflected on Rockefeller's father as well as on himself. Some months later both Rogers and Archbold were greatly pleased with the reception given to their public statements, and Rockefeller changed his policy of refusing publishers. F. N. Doubleday, eager "to undo much harm" which Doubleday, Page & Company had done by distributing Ida Tarbell's book, a part of the assets which came to the house with the purchase of McClure, Phillips & Company, urged Rockefeller to present his opinions to the public.[65] As a result, *The World's Work* published *Random Reminiscences of Men and Events* in serial form, starting in October, 1908. The book followed the next year. In a letter to an enthusiastic reader, as in the work itself, Rockefeller expressed his complete confidence in the policies of himself and his associates: "I do not see how we could go over the same road again and do better. We have tried to do the right square thing, and I can but believe that future history will so record."[66]

By no means all the approval of Standard Oil came from within. The height of the muckraking appears to have been reached and passed by 1906. Perhaps Ida Tarbell's articles in the summer of 1905 marked, for that time, a high point of vindictive personal attack. She pictured Rockefeller as a "blank" eyed, hairless man with a "cruel" mouth, "puffy" cheeks, and "unclean flesh." Even in that year Rockefeller commented on some "gratifying indications" of changing opinion in the current literature, and two years later he wrote: "My experience at Chicago and with the newspaper people generally of late has been very satisfactory."[67] While many critical articles continued to appear,[68] on the whole the general tone of criticism was calmer, and several writers presented a less biased or a favorable portrait of the company. In part the change appears to have been a reaction to the unbalanced attacks of some of the muckrakers. In 1907 the editor of *The Nation* stated that it had been "both easy and popular to attack" Standard Oil. "To take a kick at it has, for years, been

the safe courage of insincere politicians." The writer declared: "Even the Standard Oil Company is entitled to its day in the newspapers, and on the stump, as well as in courts."[69]

During these years the literature circulating which favored Standard Oil was of many different types. At one extreme was the novel by a physician, John Christopher O'Day, whose relationship to Daniel and D. J. O'Day has not been ascertained. Standard Oil men were the heroes of *Oil Wells in the Wood.* The villain, one Weatherbee, was a small operator who tried to worm his way into the combination "with the tactics of a snake." His underhanded methods included an attempt to lure "a declining politician" to introduce bills injurious to Standard Oil and the siphoning of oil, sold to the big combination, back into his own wells through a secret pipeline.[70] Interestingly enough, the novel was published soon after the National Transit Company had won before a jury its first case over the loss of oil by theft, a not infrequent problem for the pipelines.[71] About the same time a religious editor, G. Frederick Wright, wrote an article, "The Ethics of Standard Oil," for the *Bibliotheca Sacra.* In it he defended Standard Oil and called the attention of its attackers to the ninth commandment, one frequently broken, he declared, by those who virtuously upheld the eighth.[72]

Manifestations of friendly journalism included the sympathetic portraits of some of the combination's important leaders. F. N. Doubleday, impressed by his conferences with Rockefeller, arranged a luncheon at the Aldine Club for a group of magazine publishers to meet John D. Rockefeller, John D. Rockefeller, Jr., and H. H. Rogers. Doubleday later wrote an appreciation of a "modest and friendly" man, which was in marked contrast to the "mob judgment" of Rockefeller.[73] Similar articles on the oilman's work and philanthropy appeared in newspapers, for example in *The New York Times* on October 20, 1907. Even the *New York American* printed an enthusiastic description by a former employee of Rockefeller as a "just and kind" man. Several articles in praise of Dodd, "the first great corporation lawyer in the world," appeared after his retirement in 1905. Through Herbert N. Casson's "The Master Builder of Standard Oil" in *Broadway Magazine,* the American public got a picture of the father of the trust as a "genial and quiet-natured man of undoubted integrity" who "brooded over the Standard Oil like a hen with one chicken."[74]

A number of descriptive articles on Standard Oil's operations, especially in foreign trade, also appeared during these years. Harold J. Howland

published his article, "Standard Oil," in *The Outlook* in September, 1907, and it received still wider circulation through reprints and translations into foreign-language magazines. A eulogistic description, in marked contrast to Lloyd's sulphuric ink, came from the pen of that extremely prolific popular writer, Elbert Hubbard, who also wrote an appreciation of H. H. Rogers. In his book, *The Raid on Prosperity,* Chancellor James R. Day of Syracuse University devoted several chapters to the combination's work. C. M. Keys contributed two articles on the activities of Standard Oil to a series on "Great Corporations" in *The World's Work.* In these factual, well-illustrated articles, Keys presented a straightforward account of how the company functioned.[75] He gave an impression of men meeting the routine problems of daily business efficiently in contrast to the muckrakers' picture of men maturing far-reaching, sinister plans to be carried out by questionable methods.

Though the financial strength of Standard Oil itself, and the many outside interests of its chief owners, continued to occasion unfavorable comment, several writers approached the subject in a more balanced manner. In contrast to Lawson's *Frenzied Finance* and similar effusions, which visualized Standard Oil controlling everything in which any of its stockholders ever had a share, Anna Youngman wrote in more measured terms for *The Journal of Political Economy* in 1907. She referred to the Standard Oil Trust as "the most advanced type of industrial organization in existence at the close of the eighties" and commented with favor on its policy of plowing back profits to the improvement of the industry. Yet she, too, was fearful of the fact that its chief stockholders invested mounting dividends in industries other than petroleum. From the middle of the 1890's, she thought, these men were developing into "an important investment power" with possibilities of group control.[76] In the same year, however, *The Nation* explained these large financiers to their critics, and the *New York Evening Post* and other journals commented with favor on the important advantages for the economy of the way these men had used their financial strength during the panic.[77]

Perhaps no defender outside the company itself spoke more vehemently in favor of Standard Oil than Paul Dvorkovitz, editor of *The Petroleum Review.* Although his English periodical carried advertisements of many oil companies, he frequently wrote editorials supporting the American combination. That did not prevent him, with all the refreshing frankness of an editor of the time, from criticizing particular policies of Standard Oil or from giving prominence to a fiery speech of Marcus Samuel against

his American rival, with the explanation that it was "the rule rather than the exception for one company to say rather hasty things about its competitor."[78] Dvorkovitz considered that the combination's greatest contributions lay in its improvement and standardization of products, its "grappling with the problem of over-production" by providing storage facilities and rapidly developing a system of pipelines, its discovering and developing new uses for petroleum, and its habit of constantly using its organization to widen the market while stabilizing the industry. The editor doubted whether the American industry could have shown its amazingly rapid growth without the combination's financial strength to develop new petroleum fields and new markets. He believed that its able management had contributed not only to its own success but also to making production of crude oil in America exceedingly profitable.[79]

Dvorkovitz compared the growth of American industry with that of the Russian, to the credit of "private enterprise" in the United States in general and to the Standard Oil in particular. He brought to the attention of the readers of English the opinion of Russian writers who considered Standard Oil's pipelines and successful organization of marketing the essentials to the development of the industry, factors their country so badly lacked. Dvorkovitz himself declared that in Russia the government's exorbitant railroad freight rates, slow provision of trunk pipelines, and high charges on them had proved handicaps compared with the favorable conditions for growth in the United States. When visiting this country in 1905, the editor suggested that the disgruntled among the ten thousand corporations and individuals producing crude oil should send a delegation to Russia to study conditions in general and those of the producers in particular. He presented statistics of the spread between the price of products and crude petroleum in the two countries and concluded: "Sufficient evidence is therein given to convince the most stubborn, that though 'under the yoke' of the Standard Oil Co., the lot of the American producer is immeasurably better than that of his *confrère* in Russia."[80] Analysis of the reasons for the marked contrast in the development of the American and Russian petroleum industries in the twenty-five years following 1882 is indeed worthy of attention.

When writing of the struggle between what Dvorkovitz termed the two great houses, 26 Broadway and the White House, he was particularly critical of the United States government. He argued that it was strange to brand a company for restraint of trade when it had been instrumental in the wide geographic spread of an industry. Writing in the highly com-

petitive market of Great Britain, he found almost amusing the claim that Standard Oil had destroyed rivals. The Garfield Report the editor characterized as "most mendacious" and "nothing short of one long defamatory libel." He proclaimed that it would "long stand as an example of what a mind is capable of imagining as fact when once it has sunk to such depths of contemptible bias."[81] Dvorkovitz publicized the "incredible" request of Frank Walker, economist and agent of the Bureau of Corporations, to Frederick Lane, representative of the Rothschilds. Walker asked for information on Rothschilds' agreements with Standard Oil, urging that the United States government then would have proof to dissolve the American competitor. Lane himself informed Standard Oil of Walker's appeal and declared that for a rival to give such information for his own self-interest would be "the grossest possible breach of good faith."[82]

Because foreign trade was so important to Standard Oil, the friendly editorials and descriptive articles of the *New-Yorker Handels-Zeitung* were particularly welcome to Archbold and his associates during the years from 1909 to 1911. Newspapers in Germany were pointing out that the Sherman Antitrust Act was applied only where public opinion had shown special hostility to a company. The German government appeared to interpret the dissolution suit as a lack of interest on the part of the United States government in Standard Oil's export business. The movement for a German monopoly of petroleum gained in momentum, inspired, Standard Oil men believed, by their competitors. At this time the *New-Yorker Handels-Zeitung* carried to Germany not only factual articles but comments on the inconsistency of Gustav Stresemann in asking for an investigation of the American oil combination and painting it as a bogey in a country where the general movement was toward a community of interests.[83]

One contemporary study of the early years of this period devoted attention to an evaluation of the critics of Standard Oil rather than to an explanation of its work or point of view. Ambrose Paré Winston, an economist at Washington University, St. Louis, published an article, "Public Opinion and the Standard Oil," in the *Bulletin* of the Washington University Association in April, 1908. The author made a brief but careful analysis of the inconsistencies and misleading presentation of Ida Tarbell's book, the testimony in the famous Indiana case, and the strained interpretations in the *Report of the Commissioner of Corporations on the Petroleum Industry*. The author decried the tendency of those with conclusions in mind and a desire for a turn of phrase to color a story to

change facts to conform to their own needs. As typical of many such examples, he quoted an item from the *St. Louis Post Dispatch* of April 26, 1906. The reporter lightly stated that after Mr. Rockefeller had given help to the sufferers in the San Francisco earthquake, the price of oil went up. In fact, the contribution coincided with a reduction in the price of kerosene, although the events were unrelated. Winston himself tried to present a more realistic picture of the actual economic rivalry than the theoretical one of free competition.[84]

The economist included two important warnings in his article. As the government's functions were extended, and reports such as that of the Commissioner of Corporations were published, the author reminded readers that because a report was "official" it was not necessarily accurate. "This addition to the function of government—pronouncing authoritatively upon difficult economic questions—has a double danger," Winston believed. "There is no guarantee that our economic pope will prove infallible as to matters with which he need not be familiar; it is also probable that few such officers will resist the temptation to tell the people what the popular prejudice demands." Since public opinion and legislation are affected by accounts of our economic life, they should be approached with objectivity and not with emotion, he advised. "The public and the professors," Winston declared, "have not generally learned that the facts of business life, if they are to be dealt with wisely, must be subjected to methods of inquiry and reasoning as rigid as those employed in other departments of science."[85]

Actually, the balance of many of the journalists during these years was highly commendable. It is even difficult at a later date for historians reading briefs to remember that the purpose of lawyers on both sides was then, as now, to win a case, not to arrive at economic truth. Some newspapermen were carried away by the acid testimony of opponents of Standard Oil and by the arguments of prosecutors.[86] Though those rang with the zeal of reformers, other journalists viewed them calmly as motivated by the more immediate end—a professional victory. By 1911 even the cautious Elliott commented that there appeared to be a favorable modification in public opinion.[87] The general tone of newspaper comment had changed from the muckraking of the first five years of the century.

DECISION AND DISSOLUTION

This greater tolerance of the newspaper and periodical press toward Standard Oil probably heartened the directors in their decision to fight

for the preservation of the combination in the court of last resort. At any rate, Milburn and his associates appealed the decision from the District Court to the Supreme Court of the United States.

The Supreme Court accepted the appeal and heard arguments for and against reversal of the decision of the lower court. To facilitate proceedings, the high tribunal agreed to take in evidence the twenty-one printed volumes of testimony and exhibits, plus the pleadings and appeal papers as Volume "A" and all evidence in the first Ohio case as Volume 22. Both the appellants and United States counsel filed briefs and presented arguments. The brief for the federal government reviewed all findings and emphasized that the enormous earnings upon the issued capital stock were proof of monopoly and restraint of trade. The keynote of Milburn and his fellow lawyers was that the decree of the District Court impaired the rights of individual citizens of the United States. The claim that the seven individuals and the corporate entities were engaged in lawful enterprise was underscored and emphasized. The Standard Oil organization was portrayed as a lawful and natural outgrowth of the business begun in 1862; Rockefeller and his associates by using their skills and capital had created an entirely new, unique and unprecedented producing, transporting, storing, manufacturing, and marketing organization. On these and other grounds counsel for the appellants insisted that the lower court had erred in holding the seven individuals, Jersey Standard, and the 37 affiliates guilty of monopoly and restraint of trade.[88]

The final decision of the court did not come until May 15, 1911. One of the judges died, resulting in delay in writing the opinion. In view of the change in the composition of the bench, it was decided to hear the arguments for a second time. If President Taft had not begun to show signs of impatience, the day of reckoning for Standard Oil might have come still later.

Chief Justice White read the opinion of the court. Written in laborious prose, it upheld the jurisdiction of the court and reviewed the history of the Standard Oil combination from its inception. Legal methods of holding and managing the properties came in for full exposition. Following the precedent of the lower court, the justices eliminated from consideration the "jungle of conflicting testimony covering a period of forty years" as to the legal or illegal character of Standard Oil competitive practices. White asserted that evaluation of the evidence would be "a duty difficult to rightly perform and, even if satisfactorily accomplished, almost im-

possible to state with any reasonable regard to brevity." That this view was correct is amply demonstrated by the length of this present book.

The White opinion included the now famous distinction between reasonable and unreasonable restraint of trade. After reviewing British legal history on that subject, the learned jurist concluded that a proper evaluation of the text of the Sherman Act indicated that "it was intended that the standard of reason which had been applied at the common law and in this country in dealing with subjects of the character embraced by the statute" should be used as the measure "for the purpose of determining whether in a given case a particular act had or had not brought about the wrong against which the statute provided."

Later in his opinion Justice White clarified his point. He asserted that it did not necessarily follow that, just "because an illegal restraint of trade or an attempt to monopolize" resulted from the transfer of stocks of subsidiary corporations to Jersey Standard, "a like restraint or attempt to monopolize or monopolization would necessarily arise from agreements between one or more of the subsidiary corporations after the transfer of the stock by the New Jersey corporation."[89] Acceptance of this dictum by jurists later has permitted large combinations of capital, the economies of mass production, and the advantages of mass distribution, which are so important to the consumer and to the maintenance of a high standard of living in the United States.

All members of the bench agreed that the facts in the case indicated both intent and actual achievement of monopoly and restraint of trade. The justices thought "no disinterested mind" could survey the acts of the Standard Oil group from the 1870's onward "without being irresistibly driven to the conclusion that the very genius for commercial development and organization . . . begot an intent and purpose . . . to drive others from the field and to exclude them from their right to trade and thus [to] accomplish the mastery which was the end in view." That Standard Oil controlled only a small percentage of crude oil production was regarded as insignificant, since "substantial power over the crude product was the inevitable result of absolute control" over the refined product. Therefore, the Supreme Court affirmed the decision rendered at St. Louis in November, 1909.

The only change made involved the implementing of the decree. In the opinion of Justice White and his associates the lower court had not allowed sufficient time for carrying out the separation of the thirty-seven companies from Jersey Standard. They raised the time allowed from thirty

days to six months, but left the responsibility for compelling compliance with the decree in the District Court.

Ironically, within a month after this decision, Standard Oil men heard good news from Kansas, the state where agitation had pushed the combination along the path to dismemberment. In June the special commissioner in the ouster suit against Indiana Standard, Kansas Standard, and Prairie Oil & Gas reported to the Supreme Court of Kansas a generally favorable picture of the behavior of the Standard Oil companies. Among many other findings, the commissioner, citing the evidence advanced, pointed out that the three Standard Oil corporations exercised different functions and that their organizers had never intended them to be competitive; that the three companies had opposed the increase in railroad rates in 1904 instead of asking for it when they got their own pipelines, as alleged; that competitors had not been killed off but had increased in numbers; that the Standard Oil units had not contributed to the failure of numerous oil companies in Kansas; that the decline in the price of crude oil was largely attributable to production in excess of market demand; that the quality of Standard Oil products had been gradually improved and prices reduced; and that an ouster would be detrimental to the general public. On June 15, 1911, the Supreme Court of Kansas approved an agreement, previously negotiated by the attorney general and the companies, which stipulated that the three Standard Oil units should not make contracts in restraint of trade and limited each to the exercise of functions performed by it during the preceding decade.[90]

By consultation with the judges of the District Court in St. Louis, Standard Oil executives and counsel were enabled to make all arrangements for complying with the dissolution decree. The six-month period began on June 21, 1911. On July 28 the directors announced that the separation of the companies would take place as of the following September 1. All Jersey Standard stockholders of record on that date received their ratable proportion of the stock in each of the enumerated companies. A holder of one share in Standard Oil Company (New Jersey), for example, received one full share of Anglo-American Oil Company, Limited, stock, 49,996/983,383 of a share of stock in The Atlantic Refining Company, 2,747/983,383 of a share of Waters-Pierce Oil Company stock, and so on. For thirty-two companies the transfer was completed by December 1. Anglo-American shares were not ready for distribution until the following January 20, a fact of which the federal Attorney General and the court were fully informed.[91]

As agreed to by the court, the separatees numbered thirty-three instead of the thirty-seven listed in the decision of November 20, 1909. The latter had included the Corsicana Refining Company (actually the Navarro Refining Company after 1907) and the Security Oil Company, both of which had been legally severed from Jersey Standard by decision of a Texas court on October 26, 1909. In that same year the liquidation of The Manhattan Oil Company had been completed, that of the Standard Oil Company (Iowa) was far advanced in 1911, and both were absent from the final list.

In carrying out the separation Jersey Standard's top management had one outstandingly serious problem—that of apportioning executives and staff.[92] The Rockefellers and several other inactive directors resigned. Archbold moved up to the presidency of Jersey Standard, Folger to that of New York Standard. In several other separated companies former vice-presidents emulated Archbold and Folger, in others (Galena-Signal and Vacuum, for example) the old management just kept going to the office as usual. Many young men attained directorships much earlier than they would have under the old order, though the trusted, trained personnel was so sparse that several units reduced the number of directors at the last meeting of the boards under Jersey Standard aegis. The pipeline companies picked directors, many of them elderly, from among their superintendents. All companies had to work out new staff organizations. Jersey Standard and New York Standard probably came off best in the shuffle; they divided most of the functioning units at 26 Broadway, though each had to build some new ones in the years following 1911.

As carried out, the decree legally separated the companies. All the major producing, pipeline, manufacturing, and marketing units legally now stood alone, or virtually so. New York Standard, Vacuum Oil, Indiana Standard, Atlantic Refining, and Ohio Standard possessed both manufacturing and marketing facilities. Standard Oil Company (California) was the only former member of the combination in the United States enjoying the status of a fully integrated organization. Being free, all had to work out new contractual arrangements, though producing and transportation units particularly had to rely almost exclusively upon their former clients. The pipelines ran to specific refineries. In fact, the lines of supply and distribution were so firmly established that many years would necessarily elapse before new conditions and new capital investment would induce marked changes in the pattern.

Though Jersey Standard executives undoubtedly looked back to the

"good old days" of the fully integrated concern, they could still congratulate themselves that they had retained the lion's share in the dismemberment. They had four producing companies (Carter, Marion, Hazelwood, and Louisiana Standard) capable of expansion, though their output was small at the moment. Holdings in thirteen natural gas companies later proved to be satisfactorily profitable. The pipeline properties of Jersey Standard, either directly or indirectly owned, were to be found in New Jersey, Pennsylvania, Maryland, Oklahoma, and Louisiana. Foreign holdings included integrated companies in Canada and Romania and marketing organizations covering almost every important country in Western Europe except the United Kingdom, and Latin America outside Mexico. Though Jersey Standard could no longer rely upon the tanker fleets of New York Standard and Anglo-American, it still had under its influence a large and growing group of tankers owned by DAPG and American Petroleum. The marketing area of the Jersey Company in the United States was limited to New Jersey, Maryland, Virginia, the Carolinas, West Virginia, Louisiana, and Tennessee, but that territory was far from tiny and was strategically situated for expansion when the time was considered favorable.

On the manufacturing side of the business, Jersey Standard had many advantages over almost all the separated companies. Pennsylvania Lubricating, one of its remaining affiliates, still had overwhelming leadership in making and selling greases to the rapidly growing steel and tin plate mills of the country. Jersey Standard refining facilities would compare favorably with any others in the United States or elsewhere: the Bayonne plant apparently had the largest throughput of any refinery in the world at the time; the Eagle Works boasted of being the largest lubricating oil plant on earth; and the units at Bayway, Baltimore, Parkersburg, and Baton Rouge, not to mention those in Canada, Cuba, Romania, and Germany, boosted total capacity to an imposing figure. The Interstate Cooperage Company still belonged to the Jersey Company, and manufacturing of cases and cans, wooden and steel barrels, acid, and glue continued at one or more plants.

The net value of Jersey Standard properties far outranked that of any separated company. As of December 31, 1911, the net value of all properties formerly in the Standard Oil combination was estimated at $660,452,000. Of this, Jersey Standard and its remaining affiliates owned $285,532,000. New York Standard stood second with $60,024,000, and The Ohio Oil Company third with $44,052,000. That the Jersey Company came out

of the dismembering process so well was attributable in part to the many transfers of subsidiaries from the nineteen sister companies taken over in 1899, in part to new construction and corporate creations after 1906, and in part to the carelessness of the Attorney General's office in drawing up the original bill for breaking up the combination. It was unfortunate, but relatively unimportant, that Jersey Standard had few trade-marks registered in its own name and that it lost the advantage of such joint efforts of the combination as the research on "cracking" petroleum at Whiting.

For Jersey Standard stockholders and their trusted managers the future could hold no anxieties greater than those previously encountered. Archbold had participated in almost the entire turbulent history of the American petroleum industry. Even the youngest of the directors, W. C. Teagle, had experienced a thorough baptism of fire since his graduation from college in 1899. Top management of Standard Oil fortunes had in 1911 already adjusted to at least as many changes in economic and public affairs as any other group of businessmen in American life.

Much of the future success of the Standard Oil Company (New Jersey), not to mention that of its erstwhile affiliates, would depend on how well executives after 1911 evaluated the experience of the past. The lessons were many. Some were derived from sound practices, some from errors in judgment. It was apparent that the voting public, through the media of newspapers, periodicals, books, legislatures, and courts, wanted and was obtaining new rules for the conduct of large-scale enterprise in the United States. Public policy toward Big Business was crystallizing, and the Standard Oil dissolution suit was a part of that process.

By 1911 time had tested several managerial techniques to the satisfaction of Standard Oil officials. Prominent among these was decision making by consultation and agreement through committees of executives. Development and differentiation of the staff functions had provided increasingly effective aid to the committees in making recommendations and in arriving at conclusions. Among the most influential of these staff functions which aided in formulating policies and controlling their application were the standardization of accounting and auditing procedures and the systematic collection and evaluation of large bodies of statistical data. Innovations in administrative techniques, as well as in methods of production and manufacturing, were at the root of the organization's success.

Several general policies had contributed to the efficient and profitable

operation of Standard Oil enterprises. Vertical integration, from the production of crude oil and the manufacture of refined products to sales to retailers, was one of the most effective methods of organizing a petroleum enterprise, a lesson that competitors were learning at the same time. Ownership of both gathering and trunk pipelines was deemed economically desirable, if not absolutely necessary, in order to assure a steady flow of raw material to relatively immovable refining plants involving large investments. Effective location of manufacturing plants was a factor of major importance to profitable operation. Dominance in manufacturing did not assure control of all the uncertainties in the market; expansion into wholesaling at home and abroad minimized some of the variables. Since the industry was dynamic, continuous growth of the combination seemed imperative, and expansion through reinvestment of a sizable proportion of the combination's own earnings had functioned well.

Various other conclusions based on the experience of Standard Oil could almost be termed axiomatic. The economics of large-scale operations were substantial, not only in the reduction of unit costs but in a large number of other ways. A large business could finance experimentation and research, and develop by-products, more effectively than a small one. Differentiation of products helped to keep earnings at a high level as profit margins narrowed on items earlier considered basic. The various functions of the oil industry never were in balance, but integration of a large enterprise helped to minimize the maladjustments. Careful financial management of a large unit enabled executives to shift investment to the continuously developing new producing areas, new machinery, and new processes.

The greatest mistakes of Standard Oil executives stemmed from their failure to perceive and to evaluate the significance of two basic convictions of people in the United States. Americans had always opposed monopoly and believed that every man, whatever the size and influence of his business, should have an equal chance in the market place. Fear and hatred of monopoly were ingrained; the attitude dated from colonial experience. The electorate tended to identify size with monopoly, though there was no definition of what proportion of the market amounted to monopoly. It was enough that the percentage (more than 80) held by Standard Oil was considered too much. The power of that preponderant size obviously denied or contravened equality of opportunity in the market, especially in view of some of the practices of the combination.

Standard Oil executives learned all too slowly, and only under severe

public and political pressures, that dominance in power brought the responsibility of applying that power with restraint. They went too far in using their strength to gain advantages in transporting crude oil and refined products; no amount of service to producers and other interested parties could offset the antagonism generated. Watching a competitor closely and checking on his activities were acceptable when the firm was next door or across the street; for a dominant firm to apply that principle in a national market was regarded as espionage and unfair competition. Secret deals, *sub rosa* partnerships, and hidden companies were as old as business itself, but the voting public became convinced that such practices on the part of a dominant firm in an industry were unfair. Giving away products to induce a buyer to cancel a contract resulted in the ouster of a Standard Oil company from the state of Tennessee. When competitors were approximately equal in size and power, local price cutting was an accepted, even major, competitive weapon, but it was not acceptable if an overwhelmingly dominant firm in the national market followed the same practice.

Experiences in labor relations, though not so conclusive as those in transportation and marketing activities, pointed to the desirability of re-evaluating basic managerial attitudes toward workers. As early owner-managers died or retired, and the size of the enterprise increased, the days of intimate contact and understanding between employer and employee had passed into limbo. Executives had yet to learn that a benevolently patriarchal position, however advanced it might be for its time, would not satisfy the desires of ambitious, articulate, literate, individualistic employees.

Several lessons in the area of legal affairs and public relations seem clear now, if they did not to executives of Big Business in 1911. Large units are vulnerable by their size and power. In 1900 large business units had only recently been developed, and the normal human reaction to the new and the strange is antagonism. Change must be explained to be understood and accepted. Purely defensive measures avail little against a rising tide of public opinion. Regulation started with intraindustry conflict; to offset the overwhelming power of Standard Oil, opponents appealed to public opinion and turned to the legislatures and the courts, not only to obtain aid for themselves but to impose restraints on their leading competitor. Only by avoiding intraindustry combat through working out rules of fair competition and conforming to the convictions of the electorate, even if the managers may think that some of the ideas

are mere prejudices, can any man or any group of men establish and maintain a large business for any extended period of time. Management must understand the public and explain itself honestly to the public.

Standard Oil men as well as other executives might well have seen by 1911 that the operation of a large business within the letter of the law was not enough, that the law was dynamic, not static. Rockefeller, Archbold, and their associates had tried to manage their enterprise within the law as counsel indicated that law to be, but new laws were passed as the size of the business units grew. The Supreme Court followed popular conviction and the election returns, as it normally does under the democratic process.

Some of the implications of the decision of 1911 with reference to public policy were easily perceptible at once; others were not clear for some time to come. The judges showed that a large business, vested with great power within an industry, would be disciplined if not managed in accordance with the wishes of the electorate as interpreted by legislators and the courts. At the same time, the decision did not return the industry to unrestrained competition; the judges tacitly recognized the economic advantages of large aggregations of capital if they were effectively utilized for the common good. There was no denial of the right of a company to compete in a national market, though the national marketing organization of the combination was broken up. Through the rule of reason, however, the judges left the way open for further combination and growth in size, subject to review by administrative agencies, Congress, and the courts. To thoughtful students of later years the decision possessed elements of true statesmanship, being at once a punishment for inability or unwillingness to adjust to changed conditions of operations and a recognition that the trend toward organization of business on a large scale was fundamentally sound. Thus the decision seemed to be the inevitable consequence of factors and forces at work in the thinking of Standard Oil executives, in the industry generally, in the economy, in public opinion, and in political pressures of that time.

Changes in the making since the formation of the Trust, supplemented by the character of the decision of 1911, set the pattern of competition in the petroleum industry after that date. The Standard Oil share of the world market had been shrinking since the rise of strong firms dealing in Russian petroleum products in the 1880's, the emergence of Royal Dutch and Shell after 1890, and the spectacular expansion after 1900 of American firms basing their operations on oil from Oklahoma, Texas, Illinois, and

California. The decision made certain that, in addition to new, strong firms always outside the combination, formerly associated Standard Oil companies would ultimately compete with each other.

Having been disciplined for their mistakes and shortcomings, Jersey Standard executives turned their experience to the administration of their weakened but far from impotent enterprise. The extent to which they effectively applied the lessons of the past to markedly different operating conditions after 1911 constitutes a major theme in the later history of the Standard Oil Company (New Jersey).

Notes

Since many of the following notes refer to business papers not open to the public, no attempt has been made to give their exact location in offices and vaults. Inasmuch as interest centers in the type of materials used, however, some explanations are made in the notes, references are made to specific collections, and a list of abbreviations is given below. The term Records is used to refer to a variety of business records, including correspondence. In the case of the notes which refer to papers in the custody of Standard Oil Company (New Jersey) or its affiliates, unless the records deal with the business of the company which now houses these records, the present location is of no significance and the general reference to SONJ is used. Other corporations and individuals kindly made their own papers available to the authors, and the notes and abbreviations are guides to the nature of this material.

LIST OF ABBREVIATIONS FOR MANUSCRIPT MATERIALS

Acme Recs.	Acme Oil Company Records
Archbold Recs.	Collection of letters addressed to John D. Archbold
Corp. Recs.	Corporation Records
Corp. Reg.	Corporation Register
Dodd Recs.	Letters from S. C. T. Dodd
Elliott Recs.	Letters to and from Mortimer F. Elliott
ETC Minutes	Minutes of the Export Trade Committee, 1887-1888
Export Trade Recs.	Large collection of letters and other papers dealing with foreign trade from 1890
O'Day Recs.	Letters to and from Daniel O'Day
Real Estate Recs.	Real estate and tax records
Rockefeller Recs.	John D. Rockefeller records, including personal and business correspondence
Socony P. P. Co. Recs.	Socony Paint Products Co. Records, Cooperage Committee letters
Socony Recs.	Old records of Standard Oil companies provided by Socony-Vacuum Oil Company, Inc.
SONJ	Standard Oil Company (New Jersey)
Williams Recs.	Letters from T. J. Williams

CHAPTER 1

1. The following books furnished the information for the sections covering the years 1859-1870: *The Derrick's Handbook of Petroleum*, 2 vols. (Oil City, Pennsylvania, 1898-1899), hereinafter cited Derrick's *Handbook*; Paul H. Giddens, *The Birth of the Oil Industry* (New York, 1938); James D. Henry, *History and Romance of the Petroleum Industry* (London, 1914); Rolland H. Maybee, *Railroad Competition and the Oil Trade, 1855-1873* (Mt. Pleasant, Michigan, 1940); John J. McLaurin, *Sketches in Crude Oil* (Franklin, Pennsylvania, 3d edition, 1902); Allan Nevins, *John D. Rockefeller*, 2 vols. (New York, 1941); *The Oil and Gas Journal—The Oil City Derrick*, Diamond Jubilee Number, "Depicting 75 Years of Development [of the] Petroleum Industry, 1859-1934" (hereinafter cited as *Pet. Ind.*); F. W. Robins, *The Story of the Lamp (and the Candle)* (London and New York, 1939); Waldemar Scheithauer, *Shale Oils and Tars and Their Products* (London, 1913); Ida M. Tarbell, *The History of the Standard Oil Company*, 2 vols. (New York, 1904); Charles A. Whiteshot, *The Oil-Well Driller* (Mannington, West Virginia, 1905).

2. The Atlantic Refining Co. Minute Bk., which one of the authors read in the offices of the company in Philadelphia.

3. Some data on this section came from the books by Maybee, McLaurin, Tarbell, and Whiteshot, but Nevins' *Rockefeller* furnished the core of the narrative. Throughout this volume, references are to the two-volume biography published in 1941, although the authors later consulted Allan Nevins, *Study in Power*, 2 vols. (New York, 1953). Other basic references were the Derrick's *Handbook*, *Pet. Ind.*, George H. Burgess and Miles C. Kennedy, *Centennial History of the Pennsylvania Railroad Company, 1846-1946* (Philadelphia, 1949), and Walter F. Taylor, "History of the Standard Oil Company," unpublished manuscript, found in SONJ records and compiled for use of defense counsel in the suit for dissolution of Jersey Standard, 1906-1911.

4. Derrick's *Handbook*, I, 711, 783.

5. Old records of Standard Oil companies provided by Socony-Vacuum Oil, Inc. (hereinafter cited Socony Recs.), receipts, bills of sale, exemptions from damages, and other items, Feb. 15–Mar. 28, 1872. Only 9 of the 23 contracts involved $10,000 or more. The largest was $251,-110 paid to Clark, Payne & Co. and the smallest $1,000 to Jones, Cline & Co.

6. *United States* v. *Standard Oil Company (New Jersey) and others*, Testimony (hereinafter cited *U.S.* v. *SONJ*), XVII, 3447. In addition to reading the analyses of the South Improvement scheme in Maybee, *op. cit.*, Tarbell, *op. cit.*, and Nevins, *op. cit.*, we read *A History of the Rise and Fall of the South Improvement* (Lancaster, Pa., 1873), and L. W. Bacon, *History of the South Improvement Company* (New York, 1907).

7. Socony Recs., a series of documents bearing on the Petroleum Refiners' Association, Aug., 1872–June, 1873.

8. U.S. Bureau of Mines, *Mineral Resources of the United States, Petroleum* (hereinafter cited *Mineral Resources*, and the specific year; in the first year, 1882, it was published by the U.S. Geological Survey; sometimes in the copy used the pagination for the petroleum section was separate), *1897*, 12; Derrick's *Handbook*, I, 711, 806.

9. Socony Recs., receipts, bills of sale, and transfers of Portage Oil Works, Eagle Oil Works, Toledo Rock Oil Refinery, and Imperial Refining Co., Limited, plus copy of agreement for purchase of portions of three pipelines from Vandergrift & Forman, Aug. 1, 1873, and attached memorandum.

10. SONJ, Acme Oil Co. Records (hereinafter cited Acme Recs.), Central Association contract with Pickering, Chambers & Co., Apr. 7, 1875. H. H. Rogers stated in 1879 that there was only one refiner in the New York area who had not been in one or another association [*Proceedings of the Special Committee on Railroads Appointed under a Resolution of the Assembly to Investigate Alleged Abuses in the Management of Railroads Chartered by the State of New York*, 8 vols. (Albany, 1879)—hereinafter cited as *Hepburn Comm.*—III, 2615].

11. Festus P. Summers, *Johnson Newlon Camden, A Study of Individualism* (New York, 1937), 172-173.

12. SONJ, stock ledgers, dividend records, certificate and transfer books, and minute books of various companies absorbed or affiliated, including Pennsylvania Standard transfer book and The Standard Oil Co. (Ohio) original Minute Book, 1870-1885 (now back in possession of Ohio Standard); Acme Recs.

13. Offprint of "Autobiography of an Oil Company," *Tide Water Topics* (Nov.-Dec., 1923); "A Brief History of the Tide Water Companies, as told in speeches at the Tide Water Dinner, January 17, 1913," a pamphlet, privately printed.

14. SONJ, letters to and from Daniel O'Day (hereinafter cited O'Day Recs.), Ida Tarbell to O'Day, May 7, 1903; C. N. Payne to O'Day, May 11, 1903. The latter letter refers to a full account of "immediate shipment" prepared by Payne for Rogers to forward to Tarbell and what he considered her biased handling of the facts in *McClure's Magazine*. The tone of her letter indicates an admiration for the efforts of the pipeline men which does not coincide fully with her published remarks (see Tarbell, *op. cit.*, I, 217-219).

15. Derrick's *Handbook*, I, 294 (Jan. 17, 1878); Ohio Standard Minute Book, Apr. 4, 1878, Jan. 15, 1879.

16. Tarbell, *op. cit.*, I, 402.

17. SONJ, Stock Ledger and Certificate Book of the Producers' Consolidated Land & Petroleum Co.; Taylor, *op. cit.*, 157-158. The other producing properties were the Smith Farm near Franklin, the Germania Mining Co. (worthless), and the Galena Farm Oil Co., Ltd.

18. Taylor, *op. cit.*, 390-395; Rockefeller Records (hereinafter cited Rockefeller Recs.), J. D. Archbold to John D. Rockefeller, June 2, 1881.

CHAPTER 2

1. Data on the men discussed in this section were derived mainly from the following sources: Ohio Standard Minute Book, 1870-1881; Rockefeller Recs.; SONJ, short biographical material on directors; Allen Johnson and Dumas Malone, editors, *Dictionary of American Biography*, 21 vols. (New York, 1928-1944); *National Cyclopaedia of American Biography*; A. R. Crum and A. S. Dungan, editors, *Romance of American Petroleum and Gas*, 2 vols. (New York, 1911); Nevins, *Rockefeller*; McLaurin, *Sketches in Crude Oil*; Taylor, "History of the Standard Oil Company"; Derrick's *Handbook*, I and II.

2. John G. Milburn paraphrasing John D. Rockefeller, *The Lamp*, II, No. 5 (Jan., 1920), 32. *The Lamp* is published by the Standard Oil Co. (New Jersey).

3. S. W. Martin, *Florida's Flagler* (Athens, Georgia, c. 1949).

4. McLaurin, *op. cit.*, 422.

5. Reminiscences by E. T. Bedford in *The Lamp*, II, No. 5 (Jan., 1920), 30 (quotation); *The Colorful Years* (New York, Devoe & Raynolds Co., 1942).

6. *Engineering* (London), XIII (Feb. 16, 1872), 102; U.S. Patent Records, 1871-1872.

7. *Oil, Paint & Drug Reporter*, LII, No. 11 (Sept. 13, 1897), 7.

8. William Frew died in 1880.

9. Never active in Standard Oil affairs, Forman of Vandergrift & Forman invested his pipeline earnings in producing crude oil in the Bradford field and became a millionaire.

10. Reminiscences of E. T. Bedford in *The Lamp*, II, No. 5 (Jan., 1920), 30; U.S. Patent No. 120,539; SONJ, Minute Book, June 23, 1909.

11. SONJ, J. I. C. Clarke, "Memorial to John D. Archbold" (unpublished).

12. S. C. T. Dodd, *Memoirs of S. C. T. Dodd, Written for His Children and Friends, 1837 (sic) -1907* (New York, 1907); *The Venango Spectator*, n.d, but presumably 1881, in collection of clippings on Dodd lent by his daughter, Mrs. Henry Noble MacCracken, to Jersey Standard (quotation).

13. U.S. Industrial Commission, *Preliminary Report on Trusts and Industrial Combinations*, 19 vols. (Washington, D.C., 1900-1901), I (hereinafter cited as *Ind. Comm.*, I), 616; *Mineral Re-*

sources, 1882, 209; *Hepburn Comm.*, III, 2617 (Rogers).

14. Acme Recs.; Rockefeller Recs.; Socony Recs. The Acme Records contain data on more than forty purchases by Archbold and his associates.

15. Some lubricating oil specialists within the combination competed on prices until the 1890's.

16. Ohio Standard Minute Book, 1870-1881; comment by W. Rupert Maclaurin in the *Papers and Proceedings of the 61st Annual Meeting of the American Economic Association* (1948), 352.

17. *Report of the Committee on General Laws on the Investigation Relative to Trusts, March 6, 1888, New York Senate Documents, 111th Session, No. 50* (Troy, 1888), 591—hereinafter cited *N. Y. Sen. Rept. No. 50 (1888).*

18. Ohio Standard Minute Bk.

19. Acme Recs., agreement of May 9, 1879, between Eli E. Hendrick and John D. Archbold.

20. J. C. Welch, *Monthly Petroleum-Trade Report* (manuscript version in the New York Public Library), No. 60 (Apr., 1879); *U.S.* v. *SONJ*, XVII, 3630.

21. Ohio Standard Minute Bk.

22. *Ibid.*; Derrick's *Handbook*, I, 295 (Feb. 20, 1878). The suit was settled out of court.

23. *Mineral Resources, 1882,* 209.

CHAPTER 3

1. *U.S.* v. *SONJ*, XVII, 3467.

2. Rockefeller Recs., 1881, *passim*; SONJ, Consol. Accts. of S. O. Trust, Jan. 1, 1882.

3. SONJ, C. F. Ackermann to James McGee, Mar. 20, 1890; Thompson & Bedford Co., Ltd., Minute Bk., July 9, 1881; large collection of letters and other papers dealing with foreign trade from 1890 (hereinafter cited as Export Trade Recs.), summaries of letters to and from W. H. Libby, July 1, 14, 1890; "Selling Lubricating Oil in Germany," *The Lamp*, VIII, No. 2 (Aug., 1925), 24-25.

Meissner, Ackermann & Co. may have had its main office in Hamburg prior to the 1880's; Charles Meissner remained there, but the chief activity shifted to New York under the management of C. F. Ackermann and Livingston Roe.

4. SONJ, Consol. Accts. of S. O. Trust, Jan. 1, 1882. The Keokuk bulk plant was owned half and half by Ohio Standard and Alexander McDonald & Co.

5. Nevins, *Rockefeller*, II, 59-60, citing *New York Times*, Sept. 10, 16, 1881; *New York Tribune*, Sept. 16, 1881; and *New York Herald*, Feb. 23, 1882.

6. Socony Recs., S. C. T. Dodd to H. M. Flagler, July 23, 1881.

7. SONJ, misc. papers, Vilas to J. Crowell, Oct. 28, 1880.

8. *U.S.* v. *SONJ*, XIX, 618-620 (the Vilas, Keith & Chester Agreement). See also the statements of John D. Rockefeller in *N. Y. Sen. Rept. No. 50 (1888)*, 443-444.

The forty-one stockholders on Jan. 2, 1882, were as follows: W. C. Andrews, John D. Archbold, Lide K. Arter, J. A. Bostwick, Benjamin Brewster, Daniel Bushnell, Thomas C. Bushnell, J. N. Camden, Henry L. Davis, H. M. Flagler, Mrs. H. M. Flagler, H. M. Hanna and George W. Chapin (Hanna, Chapin & Co.), D. M. Harkness, D. M. Harkness, Trustee, S. V. Harkness, John Huntington, H. A. Hutchins, Charles F. G. Heye, O. B. Jennings, Charles Lockhart, A. M. McGregor, William H. Macy, William H. Macy, Jr., Estate of Josiah Macy, Jr. (William H. Macy, Jr., executor), O. H. Payne, O. H. Payne, Trustee, Charles Pratt, Horace A. Pratt, C. M. Pratt, A. J. Pouch, John D. Rockefeller, William Rockefeller, Henry H. Rogers, W. P. Thompson, J. J. Vandergrift, William T. Wardwell, W. G. Warden, Joseph L. Warden, Warden, Frew & Co., Louise C. Wheaton, and Julia H. York.

Hanna, Chapin & Co. was a partnership in Cleveland which had sold its refinery to Ohio Standard in 1876. For these forty-one stockholders Vilas, Keith, and Chester signed the Trust Agreement in 1882 as holders in trust of a large number of shares in a wide range of companies. These stockholders were the owners also of all the shares of The Standard Oil Company (Ohio). All told, there were thirty families represented in the list.

9. Socony Recs., S. C. T. Dodd to H. M. Flagler, July 23, 1881; undated letter, obviously 1881 from context; "Abstract of

the law relating to unincorporated Joint Stock Associations," undated, but signed by Dodd; *N. Y. Sen. Rept. No. 50 (1888)*, 454, Archbold's testimony.

10. *U.S.* v. *SONJ*, XVI, 3178-3179.

11. Standard Oil Trust Agreement, Jan. 2, 1882.

12. SONJ, Consol. Accts. of S. O. Trust, Jan. 1, 1882.

13. The last stipulation was contained in a supplemental agreement signed on Jan. 4, 1882.

14. SONJ, Minute Bk.

15. The Eagle Refinery was entered at cost, while the properties at Bayonne and Weehawken were listed as inventoried on Jan. 1, 1882. The real estate equaled 868 $^{104}/_{1,000}$ lots of 2,500 square feet each, or 2,210,650 square feet.

16. SONJ, Consol. Accts. of S. O. Trust, Dec. 31, 1881. The Profit and Loss account of Ohio Standard for 1881 showed earnings of $759,228 for the operation of the three manufacturing units at Bayonne but a loss of $2,760 for the Eagle Refinery.

17. "Menus and Men," *The Lamp*, VI, No. 3 (Oct., 1923), 18; "Livingston Roe," *The Lamp*, VI, No. 6 (Apr., 1925), 8.

18. SONJ, short biographical material on directors; Salary Bk. A. The cotton brokers were Merle & Bright, later Merle, Gourlie & Company, then Merle, McGee & Miller.

19. SONJ, Salary Bk. A; Memorial Sermon on Paul Babcock, Jr.; Socony Recs., S. O. Co. of New York Minute Bk.; Rockefeller Recs., 1882-1890, *passim*.

20. SONJ, Salary Bk. A; SONJ, Minute Bk.; Notebook of M. H. Eames, former secretary of SONJ; *A Short History of the Atlantic Refining Company, 1870-1936*, 5; The Atlantic Refining Co. Minute Bk.; *The Lamp*, VI, No. 3 (Oct., 1923), 17.

21. SONJ, Minute Bk.; short biographical material on directors; Socony Recs., S. O. Co. of New York Minute Bk.

22. SONJ, Salary Bks. A and B.

23. See also Chapter 5 and following chapters on foreign trade.

24. Taylor, "History of the Standard Oil Company," 189-191, citing the Journal of New York Standard.

The River and Harbor Service consisted of the tugs *Standard* and *Daylight*, the iron barge *Acme*, seven wooden barges, and two rowboats.

The Empire Yard was the Standard Oil designation for the plant known as the Empire Oil Works and owned by R. W. Burke in 1872 (Whiteshot, *Oil-Well Driller*, 107). It is not to be confused with the refinery of the Empire Refining Company, Limited, in which Standard Oil interests acquired 80 per cent ownership when it was organized by A. K. Bolan and others in 1880.

25. Data for this paragraph are drawn largely from the Rockefeller Recs.

26. Rockefeller Recs., Brewster to Rockefeller, June 8, 1885.

27. *N. Y. Sen. Rept. No. 50 (1888)*, 587; Rockefeller Recs., Babcock to Rockefeller, Sept. 24, 1888; Archbold to Rockefeller, Sept. 21, 1888.

28. Rockefeller Recs., Archbold to Rockefeller, June 5, 1886.

29. *Ibid.*, G. D. Rogers for the Executive Committee to the Manufacturing Committee, Mar. 1, 1882, and 1881-1887, *passim*; SONJ, Salary Bk. A.

30. Rockefeller Recs., 1881-1886, *passim*.

31. *Ibid.*, Warden to Rockefeller, May 4, 1881; Thompson to Rockefeller, Mar. 11, 1882.

32. *Ibid.*, Warden to Rockefeller, May 4, 1881; SONJ, Manufacturing Committee Statement Book B (hereinafter cited as Manufacturing Bk. B) refers to its predecessor, which has not been found.

33. SONJ, Minute Bk., Jan. 4, 1883, Aug. 5, 1887; Socony Recs., S. O. Co. of New York Minute Bk., Jan. 2, 1883, Aug. 2, 1887.

34. Socony Paint Products Co. Records, Cooperage Committee letters (hereinafter cited Socony P. P. Co. Recs.), circular letter signed by F. Q. Barstow, secretary of the Manufacturing Committee, Sept. 28, 1883.

35. *Ibid.*, Wheeler to Hopper, Oct. 1, 2, 1885.

36. SONJ, Minutes of the Export Trade Committee, 1887-1888 (hereinafter cited ETC Minutes), 2.

37. Rockefeller Recs., Rockefeller to O. H. Payne, Mar. 10, 1882; A. M. McGregor to Rockefeller, Mar. 14, 1882; A. J. Pouch to the Executive Committee, Feb. 16, 1881; G. D. Rogers to Manufacturing Committee, Mar. 31, 1882.

38. *N. Y. Sen. Rept. No. 50 (1888)*, 407, 574, 657-658. Written recommendations and memoranda of approval constituted the only record of the deliberations of the Executive Committee. No minutes were kept.

O. T. Waring was president of Thompson & Bedford Co., Ltd., from 1880 to 1890 and then vice-president until the company was absorbed by New York Standard in 1892 (SONJ, Thompson & Bedford Co., Ltd., Minute Bk.).

39. SONJ, Consol. Accts. of S. O. Trust, 1881-1891.

40. *Missouri* v. *Waters-Pierce Oil Co., Standard Oil Co (Ind.), and Republic Oil Co.*, Testimony, 1587.

41. Socony P. P. Co. Recs., Wheeler to Executive Committee, Feb. 20, 1885, and accompanying undated memorandum; Wheeler to Hopper, Jan. 26, Mar. 26, July 21, 1886, Mar. 11, 1887, June 7, 1889.

42. Rockefeller Recs., Rockefeller to Thompson, Mar. 2, 1885.

43. Soc. P. P. Co. Recs., Hopper memo, enclosure in Wheeler to Executive Committee, Feb. 20, 1885.

44. Rockefeller Recs., Lockhart to Rockefeller, May 25, 1882.

45. *Ibid.*, Thompson to Rockefeller, Mar. 16, 1882.

46. *Ibid.*, Rockefeller to Thompson, Nov. 5, 1885; Thompson to Rockefeller, Oct. 19, 1886.

47. *Ibid.*, Barstow to Executive Committee, Oct. 12, 1885; Thompson to Rockefeller, Oct. 9, 1885; Rockefeller to W. Rockefeller, Oct. 21, 1885.

48. *Ibid.*, W. H. Tilford to Rockefeller, Sept. 13, 1886; Archbold to Rockefeller, June 8, 1885 (quoting Squire); Frank Rockefeller to Rockefeller, 1886-1889, *passim*; Thompson to Rockefeller, Jan. 26, 1886, Feb. 25, 1889; F. B. Squire to Rockefeller, Apr. 17, 1889.

49. *Ibid.*, J. N. Camden to Rockefeller, H. M. Flagler, and O. H. Payne, Dec. 25, 1881.

50. *Ibid.*, Barstow to Rockefeller, Sept. 13, 1886; D. O'Day to Rockefeller, Sept. 14, 1886.

51. *Ibid.*, Thompson to Rockefeller, June 14, 1889.

52. Unless otherwise specified, the data for this section are drawn from SONJ, Salary Bk. A, and Consol. Accts. of S. O. Trust, 1881-1892, and the Rockefeller Recs.

53. SONJ, Eames notebook; miscellaneous memoranda, "Analysis and Classification of Cost of Original Building and of Additional Number 30."

54. See below, Chapter 21, for more detailed discussion of the financial activities of New York Standard and of the entire combination.

55. SONJ, Consol. Accts. of S. O. Trust, balance sheet of Ohio Standard and Vilas, Keith & Chester, Trustees, Dec. 31, 1881; *Missouri* v. *Waters-Pierce Oil Co., S. O. Co. (Ind.), and Republic Oil Co.*, Testimony, 1705; Socony Recs., receipt and agreement as to collateral security, signed by "J. D. Rockefeller, Prest." and F. D. Carley, Jan. 24, 1882. At the end of 1881 the W. P. O. Co. owed Ohio Standard $20,000 and the Trustees $80,000 on loans alone.

56. *U.S.* v. *SONJ*, II, 822.

57. SONJ, "Safe Deposit Vault Register No. 3" of the S. O. Trust and SONJ. The books have long since been destroyed, but the listing shows the nature of accounts kept by the Lewis unit.

58. *The Lamp*, IX, No. 2 (Aug., 1926), 19; SONJ, Salary Bk. A.

59. These generalizations are made on the basis of known contents of later correspondence, the bound volumes of the items on petroleum from *Mineral Resources of the U. S.* from 1882 onward, the comprehensive collection of newspaper clippings maintained at 26 Broadway after 1895, and ETC Minutes, 1887-1888, and Salary Bk. A.

60. Some crude oil moved by box and tank cars, and there were a few short pipelines owned by competitors of Standard Oil in the Oil Regions to local refiners.

61. Tarbell, *History of the Standard Oil Company,* II, 31-62, discusses the system in detail and gives a replica of the report form on p. 53. Her statements were fully substantiated in *U.S.* v. *SONJ,* e.g., V, 2221-2250, and X, Exhibits Nos. 715-740. There were many other records.

62. See below, Chapters 8, 15, 22, and 23.

63. Rockefeller Recs., Rockefeller to Brewster, Aug. 3, 1886.

CHAPTER 4

1. Burgess and Kennedy, *Centennial History of the Pennsylvania Railroad Company,* 789; McLaurin, *Sketches in Crude Oil,* 322-325; Derrick's *Handbook,* I, 321, 322, 920-927; Nevins, *Rockefeller,* I, 441; *Nat. Cyc. Am. Biog.,* XIV, 175.

Other individuals of importance in the National Transit hierarchy were George W. Colton, treasurer; J. H. Snow, general superintendent; Col. J. B. Maitland, superintendent of tankage; and H. McSweeney, solicitor.

Within the United Pipe Lines Vandergrift's influence lingered on in the treasurer, J. R. Campbell, who had been his trusted financial lieutenant in pipeline affairs since 1868.

2. Derrick's *Handbook,* I, 333-339, 342, 347-348, 381, 400; Tarbell, *History of the Standard Oil Co.,* II, 25, 241-242; Taylor, "History of the Standard Oil Co.," 320.

3. John P. Herrick, *Empire Oil* (New York, 1949), 195-197; Whiteshot, *Oil-Well Driller,* 149; Derrick's *Handbook,* I, 385, 400; *Report of the Committee on Manufactures on Investigation of Trusts,* H. R. IX, No. 3112, 50 Cong., 1st Sess. (hereinafter referred to as *House Trust Investigation, 1888*), 81 (Dean testimony).

The first commercial well in Allegany County, N. Y., was drilled in 1879 and the first sale to the United Pipe Lines was in July, 1881. United did not get abreast of production until June, 1882.

4. Most of the story of the construction and operation of the line to New York has been drawn from A. Stoop, "Rapport over de Petroleum-Industrie in Noord-Amerika," *Jaarboek van het Mijnwesen in Nederlandsch Oost-Indie,* 1888, 13-136; Herrick, *op. cit.,* 200-221, 229, 233; and Boverton Redwood, *Cantor Lectures on Petroleum and Its Products* (London, 1886), 31-32.

Herrick has a picture of the Olean pumping station on p. 201.

5. Charles J. Hepburn and Theodore M. Towl, the civil engineers in charge of construction, got rights of way from the Midland Railroad from Newfoundland to Midland Park, from the Erie at Saddle River station near Garfield to the tunnel above Jersey City, and from the Lehigh Valley at Jersey City to Bayonne. Meeting refusal from the Central Railroad of New Jersey, which pulled one pipeline apart, the Standard Oil men laid another line on the bottom of the Passaic River at night. Not until the defeat of a bill in the New Jersey legislature prohibiting the laying of a pipeline in Newark Bay and the Hackensack River (the grounds for the bill being that pipelines always leaked, and would contaminate oysters and kill fish) were the National Transit men certain of ultimate success. The Bayonne government cannily refused to permit a pipeline to be laid under the streets, thus forcing the Standard Oil men to pay high prices to private individuals for a right of way.

6. *Brief History of Tide Water Companies,* 23-28. The *History* says (p. 19) that when The Tide-Water Pipe Co., Ltd., was organized, "the oil business was thought to be short-lived, and much of its construction was as cheap as was possible to give good service."

7. Stoop, *op. cit.,* 130-132, states that 6" pipes were manufactured to withstand 2,000 pounds per square inch, 2" pipes 1,500 pounds. We have taken Herrick's figure.

8. Special heavy wrought-iron pipe, carrying cast-iron clamps to fortify the threaded joints, was used for the crossing of the Hudson River. Heavy chains and anchors held the line in place against the pull of current and tides. An emer-

gency line, parallel to the first, was laid for use when National Transit patrol boats and divers failed to free the anchors of ships which ignored the posted warnings on both shores not to anchor at the pipeline crossing.

9. Herrick, *op. cit.*, 229-233; Stoop, *op. cit.*, 134, 139, 142.

10. Rockefeller Recs., O'Day to Rockefeller, Oct. 9, 30, Dec. 29, 1882.

11. Benjamin J. Crew, *A Practical Treatise on Petroleum* (Philadelphia, 1887), 442-443. Fifty-seven gaugers were located in the Bradford and Allegany areas, 50 in the Lower District. Forty-three of the pumping stations were situated in Bradford and Allegany counties, 32 in Warren and Forest, and 60 in the Lower District.

12. *House Trust Investigation, 1888*, 368-370; Stoop, *op. cit.*, 139, 143-146; Redwood, *Cantor Lectures*, 32; Derrick's *Handbook*, I, 298, 313-314, 320, 350.

Most of the rules of United Pipe dated from June, 1879, though storage charges had been reduced from 2½ cents per barrel to 1¼ in April, 1878.

Tide-Water Pipe itself took care of all fire losses, but it charged slightly higher for storage than did National Transit; the latter's system was similar to the general average of marine insurance. Losses by fire in National Transit tanks for 1883 were .8%; for 1884, .4%; for 1885, .03%; and for 1886, .15%.

13. Derrick's *Handbook*, I, 357, 363, 364.

14. Rockefeller Recs., O'Day to Archbold, Sept. 14, 1881 (letters and memoranda); O'Day to Rockefeller, Feb. 2, 17, 1882; Herrick, *op. cit.*, 190-195; Derrick's *Handbook*, I, 330, 336, 346, 351, 355; Taylor, *op. cit.*, 397-398; Welch, *Monthly Petroleum Trade Report*, Jan., 1882.

Popular report had a Standard Oil employee delaying the completion of the Buffalo & Rock City by refusing to lease land for a right of way. Employees of the Erie Railroad also tore up pipe at one time, but in August, 1881, oil began moving via the Buffalo & Rock City to the plant of the Atlas Refining Co.

15. Rockefeller Recs., Warden to Rockefeller, Dec. 6, 1883.

16. *Ibid.*, 1880-1883, *passim*, especially Archbold to Potts, Nov. 25, 1881, and Archbold to Rockefeller, Oct. 12, 1883; Socony Recs., New York Standard Minute Bk., 18; Taylor, *op. cit*, 327, 398; SONJ, Consol. Accts. of S. O. Trust, 1883; Tarbell, *op. cit.*, II, 15-24, 300-308 (the contracts); Nevins, *op. cit.*, I, 585-597, and II, 62-63; *Brief History of Tide Water Companies*, 14-19.

The contracts provided penalties for failure to live up to their provisions and stipulated that there should be both daily reports upon oil received by each refinery and monthly adjustments in the amount received.

Attempts to bring Logan, Emery & Weaver into the Tide-Water deal failed.

17. *Ind. Comm.*, I, 702.

A preliminary noncompetitive schedule was set up on July 25, 1883, or before the October agreements.

18. *Ind. Comm.*, I, 663-666 (contract of Aug. 22, 1884), 700-703, 759-763; Rockefeller Recs., Flagler to Rockefeller, June 11, 21, 1884. Cf. Tarbell, *op. cit.*, II, 28-29, and Emery's testimony in *Ind. Comm.*, I, 666-667. The contract of May 6, 1881, with the Pennsylvania Railroad accorded that company the revenues on one-third of the oil moved to New York. No printed copy of the 1881 contract with the Pennsylvania has been found.

Under the 1884 agreement the Pennsylvania was to charge for a barrel of refined oil 1.3 times the railroad rates on a 45-gallon barrel of crude. Standard Oil companies paid to the Erie Railroad a rebate of 2⅞ cents per barrel of 45 gallons on all crude oil shipped to "Standard Oil Co. and interests" at New York, Philadelphia, and Baltimore while the rate remained at 45 cents per barrel (Rockefeller Recs., John Bushnell to Rockefeller, Apr. 9, 1886). Under this contract National Transit paid to the Erie $126,908.63 during the first six months of 1884 and $160,781.28 during the same period in 1885 (*ibid.*, memo of J. Bushnell, July 10, 1885).

19. Derrick's *Handbook*, I, 324, 368-370, 381; Taylor, *op. cit.*, 126, 162, 302-303, 327, 391, 392, 397-398; SONJ, Consol. Accts. of S. O. Trust, 1883-1884, and Certificate Bk. of the Smith's Ferry Oil

Transportation Co.; *Pet. Ind.*, 68; Rockefeller Recs., G. H. Vilas to Rockefeller, May 1, 1886.

The Smith's Ferry Oil Transportation Co., capital $20,000, was organized on May 14, 1872. The lines of the company ran from Smith's Ferry to Dry Run near Ohioville and to Island Run. It owned two tank cars, a few dumping tanks, and one 2,500-barrel tank at Smith's Ferry.

The Franklin Pipe Line Co., Ltd., capital $50,000, was organized Mar. 1, 1879, to take over two small lines—Taft & Payne and Franklin Pipe. At the time of the formation of the Trust, Standard interests owned 95 shares and later acquired 100 more. The line supplied heavy oil to the Galena Oil Works, Ltd.

On Mar. 4, 1885, National Transit purchased from the Grandin brothers $100,000 in shares of the Tidioute & Titusville Pipe Line Co. for $50,000 in cash and $25,000 in claims.

Terminals at New York received 1,088,091 barrels of oil in tank cars during 1885. Of that amount 752,758 barrels were special oils and were exported in large part.

20. Rockefeller Recs., Bostwick to Rockefeller, May 15, 1882; Lewis to Rockefeller, Jan. 25, 1882, Feb. 9, 1884; P. H. Judd to Rockefeller, July 30, 1884; Brewster to Rockefeller, June 16, 1884; Rockefeller to Brewster, June 18, 1884; SONJ, Salary Bk. A.

The Executive Committee began directing the purchase of oil, both at wells and on the exchanges, early in 1882.

Lewis & Co. had received brokerage of ⅝ of a cent per barrel.

21. Derrick's *Handbook*, I, 381, 395, 397, 406.

22. Stoop, *op. cit.*, 151; SONJ, Consol. Accts. of S. O. Trust, 1885; *House Trust Investigation, 1888*, 34; *Mineral Resources, 1885*, 145. The figure given is for actual crude consumed. Compare Table 20.

23. Rockefeller Recs., Archbold to Rockefeller, June 30, 1885, and 1883-1885, *passim*. See Chapter 7.

In *N. Y. Sen. Rept. No. 50 (1888)*, 398, 400, Rockefeller testified that neither the S. O. Trust nor any of its affiliates ever speculated in certificates, and that he had never heard of any of the Trustees speculating in certificates.

24. Rockefeller Recs., "Memorandum of Iron Tankage of National Transit Company on March 31, 1884," drawn up on Apr. 24, 1886. Oil in wooden tankage totaled 45,076 barrels.

The estimate of National Transit capacity as 42,000,000 barrels in Stoop, *op. cit.*, 138-139, was apparently a rounded figure.

According to National Transit's superintendent of tankage in 1888, "The greatest amount of tankage in possession of the Transit Co. amounted to a little over 43,000,000 barrels"—of which nearly 6,000,000 had been leased from outsiders and was returned to them during the second half of 1885 and early 1886. *Oil, Paint & Drug Reporter*, XXXIII, No. 8 (Feb. 22, 1888), 40.

25. McLaurin, *op. cit.*, 325.

26. *U.S. v. SONJ*, XVII, 3324.

27. General information on equipment and processes in the mid-1880's has been derived from S. F. Peckham, *Report on the Production, Technology, and Uses of Petroleum and Its Products* (Washington, 1884), 157-183; Stoop, *op. cit.*, 169-195; Redwood, *Cantor Lectures*, 34-38; H. C. Folger, Jr., "Petroleum, Its Production and Products," *Annual Report of the Bureau of Industrial Statistics*, Section B (Harrisburg, Pennsylvania, 1893), 107-119; Crew, *op. cit.*, 238-320; *Mineral Resources, 1882*, 206-208.

28. In 1768 Antoine Baumé devised two scales—one for measuring the specific gravity of liquids heavier than water and the other of liquids lighter than water. To establish the scale for the latter, which was used for oil, an ordinary hydrometer was sunk in a 10% solution of salt. The point to which the hydrometer sank in the salt-water solution was designated as zero, while the point to which it sank in pure water was marked as 10. After dividing that first measurement into ten equal parts, or degrees, the scale was extended.

29. Joshua Merrill's account in Derrick's *Handbook*, I, 885, citing patents numbered 28,246 and 28,448.

30. W. A. Cassidy, "Memories of Yester-

years," unpublished manuscript by a Jersey Standard annuitant.

31. SONJ, Consol. Accts. of S. O. Trust, 1885.

32. SONJ, trade-marks and patent papers, list of "Patents owned or controlled by the S. O. Co.," which was checked against the list submitted by S. C. T. Dodd in 1899 to the Industrial Commission (*Ind. Comm.*, I, 798). All the numbers in the two lists were then checked in the U. S. Patent Records.

On the Merrill patents the data came from SONJ, trade-marks and patent papers, Patent No. 90,284 and reissues Nos. 7,733 and 7,826; assignment of No. 7,826 by Merrill to H. H. Rogers and John D. Archbold, Apr. 1, 1884; agreement for sale of No. 7,826 by Merrill to Rogers and Archbold, Apr. 1, 1884, for $20,000.

33. Socony P. P. Co. Recs., Wheeler to Hopper, Nov. 1, 27, 1882, June 23, Sept. 6, 1883, Sept. 23, 1884, Feb. 20, 27, Mar. 2, 4, May 29, Aug. 17, Sept. 30, 1885. For example, charges for steam supplied by refineries to cooperage departments or to Hopper were set as follows:

	Cents per 100 bbls.
For hoop-driving machines	20
For gluing	10
For boring	5
For reaming	5
For elevators	5
For heating building in winter	25

34. Socony P. P. Co. Recs., Wheeler to Hopper, Feb. 27, Oct. 1, Nov. 24, 1885, Mar. 26, 1886.

35. Redwood, *Cantor Lectures,* 39; Stoop, *op. cit.*, 233; S. C. T. Dodd, *Combinations: Their Uses and Abuses* (New York, 1888), 30.

36. Rockefeller Recs., Rockefeller to Payne, Feb. 6, 1884, and Babcock to Rockefeller, Aug. 18, 1885; SONJ, Certificate Bk. of Oswego Manufacturing Co. and Consol. Accts. of S. O. Trust, 1885; Taylor, *op. cit.*, 210.

37. Rockefeller Recs., Pouch to Rockefeller, June 19, 1885.

38. Redwood, *Cantor Lectures,* 39-40; Stoop, *op. cit.*, 246; Dodd, *Combinations,* 30.

39. SONJ, Manufacturing Bk. B; Rockefeller Recs., O. H. Payne to Rockefeller, Dec. 26, 1884.

40. Rockefeller Recs., 1881-1885, *passim,* especially Thompson to Rockefeller, Apr. 2, 9, 1885; U. S. Patent No. 120,539; *Mineral Resources, 1886,* 473; C. H. Botsford, "The Price of Gas," *The North American Review,* CXLI, No. 345 (Aug., 1885), 172.

41. Charles J. Woodbury, "Rockefeller and His Standard," *Saturday Evening Post* (Oct. 21, 1911), 8-10; *The Lamp,* III, No. 5 (Feb., 1921), 22-23 (quotation).

42. *Oil, Paint & Drug Reporter,* XXV, No. 1 (Jan. 2, 1884), 33, No. 6 (Feb. 6, 1884), 13, No. 13 (Mar. 26, 1884), 16, and XXVI, No. 19 (Nov. 5, 1884), 5, and No. 21 (Nov. 19, 1884), 9 (quotation); Rockefeller Recs., Bedford to Rockefeller, Jan. 9, 1885 (quotation); S. H. Paine to W. P. Thompson, Oct. 20, 1885.

43. Rockefeller Recs., 1882-1885, *passim.*

44. *Patterson* v. *Kentucky,* 97 U.S. 501; Peckham, *op. cit.*, 237.

45. U. S. Patent No. 218,066; *Connecticut* v. *Boylan,* Testimony.

46. SONJ, Consol. Accts. of S. O. Trust, 1882-1883; Manufacturing Bk. B; Taylor, *op. cit.*, 206; *U.S.* v. *SONJ,* XVII, 3397.

47. Atlas Refinery, "History of Atlas Works," manuscript given to authors; Taylor, *op. cit.*, 204-206.

48. Rockefeller Recs., Barstow to Rockefeller, July 24, 1884; SONJ, Manufacturing Bk. B; Consol. Accts. of S. O. Trust, 1882-1885.

In terms of daily capacity all New York plants together accounted for 43,000 barrels out of a total for the Trust of 96,000.

49. SONJ, Bayonne Appropriation Bk. and cards; Consol. Accts. of S. O. Trust, 1882-1885; Cassidy, *op. cit.*

50. Rockefeller Recs., Barstow to Rockefeller, July 24, 1885; Barstow to Thompson, July 24, 1885; Executive Committee to Rockefeller, Oct. 6, 1885; Flagler to Rockefeller, Oct. 6, 8, 1885; Rockefeller to Flagler, Oct. 7, 1885; "Murkily"

(code name) to Flagler, Oct. 7, 1885; Thompson to Rockefeller, Oct. 8, 1885; Barstow to Executive Committee, Oct. 23, 1885.

51. *N. Y. Sen. Rept. No. 50* (*1888*), 385; SONJ, Consol. Accts. of S. O. Trust, 1885. In 1885 Cleveland's throughput of crude and crude equivalent amounted to 2,800,276 barrels of 42 gallons, Atlantic's to 2,108,205, and Bayonne's to 2,117,513. The sum of the three was almost 40% of the total for all plants in the combination.

52. SONJ, Consol. Accts. of S. O. Trust, 1884-1885.

53. W. L. Thorp, *Business Annals* (New York, 1926), 133-134.

54. SONJ, Consol. Accts. of S. O. Trust, 1881-1885; Salary Bk. A; Taylor, *op. cit.*, *passim*; Rockefeller Recs., S. C. T. Dodd to Rockefeller, Mar. 18, 1884; Rockefeller to O. H. Payne, Nov. 15, 1884 (quotation).

55. Rockefeller Recs., Pratt to Rockefeller, Sept. 25, 1883.

56. *Ibid.*, O. H. Payne to Rockefeller, Jan. 24, 1883 (quotation); H. A. Hutchins to O. H. Payne, Dec. 22, 1882; Hutchins to Rockefeller, May 5, 29, 1882, Mar. 30, 1885; O. H. Payne to Archbold, July 11, 1883.

57. *Ibid.*, Thompson to O. H. Payne, Mar. 20, 1883; Thompson to Rockefeller, Mar. 11, Dec. 8 (quotation), 1885.

58. *Ibid.*, Thompson to O. H. Payne, Dec. 21, 1882; O. H. Payne to Rockefeller, Jan. 24, 1885; Isaac E. Blake to Rockefeller, Jan. 3, 1882.

59. *Ibid.*, Hutchins to Rockefeller, Feb. 1, 23, 1882; Thompson to Rockefeller, May 23, 1881 (quotation).

60. *Ibid.*, Rockefeller to Executive Committee, June 6, 1885 (quotation); Rockefeller to Hutchins, Mar. 2, 1882; Hutchins to Rockefeller, Dec. 19, 1882; Thompson to Rockefeller, Nov. 12, 1884.

61. *Ibid.*, Rockefeller to O. H. Payne, Dec. 1, 1883; Rockefeller to Hutchins, Jan. 26, 1885; Barstow to Rockefeller, June 24, 1884; Warden to Rockefeller, Apr. 28, 1885.

62. SONJ, Consol. Accts. of S. O. Trust, 1881-1886; Salary Bk. A; charter of Continental Oil Co.; corporate record morgued file certificate bks. of misc. companies; misc. papers of Iowa Standard; Ohio Standard Minute Bk.; Taylor, *op. cit.*, 227, 235-236; Rockefeller Recs., Archbold to Rockefeller, May 31, 1888; Nevins, *op. cit.*, I, 657-658.

The Ohio Standard Minute Book records a contract dated Nov. 1, 1884, and signed by Ohio Standard, Continental Oil & Transportation Co., and Whittier, Fuller & Co., but the exact nature of the agreement is not known.

63. Rockefeller Recs., Archbold to Rockefeller, May 27, 31, 1885; Carley to Rockefeller, Mar. 2, 1885.

64. SONJ, Consol. Accts. of S. O. Trust, 1881-1886; Salary Bk. A and Certificate Bk. of Consolidated Tank Line Co.; Taylor, *op. cit.*, 112-116.

65. Rockefeller Recs., Hutchins to Rockefeller, Mar. 21, 1882, Dec. 6, 1883; Rockefeller to Hutchins, Jan. 7, 1884; O. H. Payne to Rockefeller, Nov. 11, 1884; Peter Schmid to T. C. Bushnell, July 19, 1886.

66. Bulk distribution in 1881 is represented by Ohio Standard's figures. Of the 55,329,685 gallons of kerosene sold by Ohio Standard in that year, 31,873,489 were shipped by tank car, 19,809,621 in barrels, 3,646,390 in cases, and 185 in individual cans.

67. Rockefeller Recs., Rockefeller to O. H. Payne, May 3, 1883; Hutchins to Rockefeller, May 7, 17, Nov. 24, 1883; Rockefeller to Hutchins, Nov. 16, 1883; O. H. Payne to Rockefeller, May 5, 1883, Mar. 12, 1884, Jan. 24, 1885; Thompson to Rockefeller, Nov. 10, 1886; SONJ, Salary Bk. A.

68. SONJ, Consol. Accts. of S. O. Trust, 1884-1885; Taylor, *op. cit.*, 211.

The capital of the American Wick Manufacturing Co. was $25,000. The loss in 1885 alone was $16,549.

69. SONJ, charter of Gilbert & Barker Mfg. Co., morgued Corporate Record; Agenda for Seaview Conference, May 16, 1944, Section 33, p. 1; "The Story of Gilbert and Barker," *The Lamp*, III, No. 2 (Aug., 1920), 10-14; *The Gilbarco Story* (G. & B. Mfg. Co., W. Springfield, Mass., 1947); Taylor, *op. cit.*, 214.

The Pratt Mfg. Co. bought all the shares in 1884, but it later resold 50 to J. F. Barker and 44 to W. C. Clarke upon the condition that they would be resold upon demand.

70. SONJ, Consol. Accts. of S. O. Trust, 1882-1886; Bayonne Appropriation Bk.; Taylor, *op. cit.*, 213.

71. Rockefeller Recs., Hutchins to Rockefeller, May 7, 1883; SONJ, Consol. Accts. of S. O. Trust, 1882-1886; *Missouri* v. *Waters-Pierce Oil Co., Standard Oil Co. (Ind.) and Republic Oil Co.*, Testimony, 1610, 1658.

72. Rockefeller Recs., O. H. Payne to Rockefeller, Feb. 14, 1882; Rockefeller to Hutchins, Feb. 18, Dec. 21, 1882; Rockefeller to Payne, Apr. 5, 1883 (quotation), Apr. 4, 1884 (quotation); Rockefeller to Thompson, Dec. 13, 1884 (quotation); Rockefeller to B. Brewster, Aug. 4, 1884.

73. *Ibid.*, Brewster to Rockefeller, Oct. 19, 1885.

74. *Ibid.*, Hutchins to Rockefeller, Feb. 14 (quotation), Dec. 23, 1882.

75. *Ibid.*, Thompson to Rockefeller, Apr. 9, 1883.

76. SONJ, Consol. Accts. of S. O. Trust, 1881-1885; Salary Bk. A.

Among jobbers owned in whole or in part by New York Acme between 1881 and 1886 were the Syracuse Oil Works, the Marvin Oil Co., and the Elmira Oil Co.; by Ohio Standard the Lake Shore Oil Co., the West Michigan Oil Co., and the Ingalls Oil Co. The property of the McKirgan brothers at Newark was partly owned by New York Acme prior to 1883, when the McKirgan Oil Co. was organized and the majority of shares were held directly by the Standard Oil Trust; it was later acquired by Jersey Standard.

77. Rockefeller Recs., L. A. Cole to Thompson, May 11, 1883; Thompson to Rockefeller, May 15, 1883 (and enclosures), Jan. 31, 1885, Apr. 27, 1886; O. H. Payne to Rockefeller, Nov. 23, 1883; Rockefeller to O. H. Payne, Oct. 13, 1884; Rockefeller to Thompson, May 2, 1885; *House Trust Investigation, 1888*, 526-537, 716-725.

78. Rockefeller Recs., Thompson to Rockefeller, Nov. 12, 1884 (quotation), Dec. 18, 1886; Archbold to Rockefeller, Aug. 13, 1884; Rockefeller to Archbold, Aug. 26, 1884; O. H. Payne to Rockefeller, Feb. 7, Mar. 11, 1884; Camden to Rockefeller, Dec. 12, 1884; Rockefeller to Thompson, May 2, 1885; Thompson to Rockefeller, Jan. 13, 1885, Apr. 27, 1886.

79. Rockefeller Recs., Thompson to Rockefeller, Nov. 17, 1885, and 1882-1885, *passim*.

The small Cleveland companies taken over at the end of 1885 were the Pioneer, Crystal, Dangler, and Forest City.

80. Rockefeller Recs., Warden to Rockefeller, Nov. 22, 1884; Barstow to Rockefeller, July 23, 24, 1884; Archbold to Rockefeller, June 26, 1885; Rockefeller to Warden, Aug. 10, 1885.

81. *Ibid.*, Thompson to Rockefeller, Feb. 6, 1885.

CHAPTER 5

1. W. H. Libby to S. S. Cox, U.S. Minister to Turkey, Mar. 27, 1886, *U.S. Consular Report*, No. 63 (Apr., 1886), 160.

2. Statistics on exports are taken from U.S. Bureau of Statistics, Treasury Department, *The Annual Report and Statements of the Chief of the Bureau of Statistics on the Commerce and Navigation, Immigration and Tonnage of the United States for the year ending, June 30, 1883*, and *Mineral Resources, 1883-1884*, 230.

Of the petroleum exports in 1882, kerosene accounted for 84% of the value, crude oil for 7%, lubricants for 5%, naphtha, benzine and gasoline for 3%, and residuum the small remainder.

3. SONJ, Bayonne Cost & Yield Statements, July 1 to Dec. 31, 1890, and Jan. 1 to June 30, 1892.

4. Redwood, *Cantor Lectures*, 54-55, 72; *N. Y. Sen. Rept. No. 50 (1888)*, 42; *U.S.* v. *SONJ*, I, 228; Rockefeller Recs., F. Q. Barstow to Rockefeller, Aug. 9, 1884.

5. H. C. Folger, Jr., "Petroleum, Its Production and Products," 7, 176-181.

Unless otherwise stated, all quantities have been converted to 42-gallon barrels.

6. Folger, *op. cit.*, 122; Rockefeller Recs., Folger to Rockefeller, Mar. 4, 1892, with

enclosure, "Refined Oil Statistics America and Russia," 1888 to 1891.

7. *Mineral Resources, 1883-1884*, 228-229.

Most of the crude oil exported went through Philadelphia.

8. Peckham, *Report on the Production, Technology, and Uses of Petroleum and Its Products*, 107-109; Whiteshot, *Oil-Well Driller*, 174-177.

9. "Foreign Legislation Relating to Petroleum," *Oil, Paint & Drug Reporter*, XXVI, No. 21 (Nov. 19, 1884), 9-10.

10. Rockefeller Recs., Archbold to Rockefeller, Oct. 13, 1885; "Custom Duties Imposed by Foreign Nations upon American Produce and Manufactures," *U.S. Consular Reports*, No. 73½ (Jan., 1887), *passim*; No. 58 (Nov., 1885), 172-173; No. 62 (Mar., 1886), 530-532.

An example of a policy scrutinized by Standard Oil was the tariff on barrels in Germany. Petroleum barrels were taxed at the same rate as oil, 6 marks per 100 kilograms, until Sept. 25, 1885, when they were subjected to an extra duty of 4 marks per 100 kilograms. Barrels were estimated at 20% of the weight of the filled barrel. There was a drawback if the barrels were exported within three months.

11. Most of the information for this section comes from a study of SONJ, ETC Minutes, 1887-1888, and Salary Recs.; Consol. Accts. of S. O. Trust, 1882-1888, *passim*.

12. SONJ, Thompson & Bedford Co., Ltd., Minute Bk., including contracts; Salary Bks. A and B; Socony Recs., agreement between S. O. Trust and R. J. Thompson, E. T. Bedford, and Thompson & Bedford Co., Ltd., Jan. 23, 1885; Rockefeller Recs., L. Oppenheim to Rockefeller, May 3, 1878; Taylor, "History of the Standard Oil Co.," 171.

Thompson & Bedford Co., Ltd., was incorporated in 1880. O. T. Waring was president. The Trust held 80% of the shares by 1885. The relation of Richard J. Thompson and Edward T. Bedford to the Trust was defined in an agreement dated Aug. 13, 1880, with later amendments. In a return for a salary of $10,000 each, and a guarantee of dividends of 36% on the par value of their stock, the two men promised to devote all their time to the firm. In December, 1890, they exchanged their stock with the Trust for Trust certificates. All property of the corporation was sold to New York Standard in 1892, and thereafter the Thompson & Bedford Department carried on the work of exporting lubricating oil and wax.

Other refiners for which Thompson & Bedford Co., Ltd., marketed wax were Pratt's Queens County Works, Paine-Ablett, Eclipse, Eagle, Atlantic, Ohio Standard, and Pennsylvania Standard.

13. Among the brokers who sometimes acted as intermediaries, G. H. Lincoln & Co. was prominent. Merchants purchasing Standard Oil products in New York and Philadelphia included Ralli Brothers, Stursberg, Ruperti & Co. (later Hermann Stursberg & Co.), Goepel & Trube, Wallace Müller & Co., The China & Japan Trading Co., and Henry Funck & Co.

Complaints about the re-use of American barrels and cans for oil without removing the brand name, or of counterfeiting the trade-mark, were quite common. It was resorted to only by small dealers and refiners of inferior petroleum; large scientific refiners wanted to develop the markets for their own products. See *U.S. Consular Reports*, 1883-1888, *passim*.

14. Rockefeller Recs., Heye to Rockefeller, Apr. 19, 1880; *Oil, Paint & Drug Reporter*, XXI, No. 11 (Mar. 15, 1882), 507.

In 1881 Heye imported 40% of the 2,204,000 used barrels brought to New York.

15. SONJ, Consol. Accts. of S. O. Trust, 1881-1890; L. D. Clarke to the Executive Committee, Apr. 29, 1890; James McGee to Clarke, undated, and Clarke to Ackermann, undated; ETC Minutes, 1887-1888, *passim*.

16. *Oil, Paint & Drug Reporter*, XXI, No. 6 (Feb. 8, 1882), 244.

Under the contract ending 1890, T. C. Bushnell agreed to put $50,000 into Meissner, Ackermann & Co. Meissner and Ackermann, who subscribed $25,000 each, were guaranteed a minimum return of $2,000 per month.

17. Taylor, *op. cit.*, 52-53; data on Canadian companies furnished by J. S. Ewing; Rockefeller Recs., O. H. Payne to Rockefeller, Mar. 10, 1884.

Rogers' firm was known as The Queen City Oil Co., Ltd., by 1884.

18. SONJ, West India Oil Refining Co. Recs., 1882-1895.

The first agreement between Conill and Archbold stipulated that only 10 to 25% of the profits should be paid out in dividends.

19. *Census Report*, 1890; Socony Recs., Schedule submitted by the Standard Oil Trust to the Bureau of the Census regarding manufacturing establishments in 1889; Rockefeller Recs., Monthly Form Reports, 1891 and 1892.

According to its own report, Standard Oil refined 76% of the total kerosene for export, 63.6% of the gasoline, benzine, and naphtha, and 65.6% of the lubricating oils.

During the months of July-Oct., 1891, Tide Water sold 57% of its export kerosene through the agency of Standard Oil.

20. D. R. Steuart, "The Shale Industry of Scotland," *Economic Geology*, III, No. 7 (Oct.-Nov., 1908), 573-575, 578, 580-584.

21. Manufacturing Bk. B, "Scottish Mineral Oil Trade," Nov. 7, 1888; Rockefeller Recs., Report on Scotch Shale Oil Companies compiled by H. C. Folger, Jr., 1886.

22. Boverton Redwood, *Petroleum*, 2 vols. (London, 1896), II, 416-417, 429-431; W. Scheithauer, *Shale Oils and Tars and Their Products* (London, 2d. edition, 1923), 4, 6, and 181; *Mineral Resources, 1886*, 484-486.

23. National Industrial Conference Board, *The Petroleum Almanac* (New York, 1946), 293.

24. Rockefeller Recs., J. Crowell to Rockefeller, July 21, 1884; Folger, *op. cit.*, 180.

25. Boverton Redwood, "The Galician Petroleum and Ozokerite Industries," *The Journal of the Society of the Chemical Industry*, XI, No. 2 (Feb. 29, 1892), 93-112; *U.S. Consular Reports*, No. 55 (Aug., 1885), 701-703; No. 64 (June, 1886), 151-153; No. 67 (Sept., 1886), 478-479; No. 73 (Jan., 1887), 67-68; No. 80 (June, 1887), 585-586; No. 83 (Sept., 1887), 409-411; SONJ, collection of letters addressed to J. D. Archbold (hereinafter cited as Archbold Recs.), Report on the Petroleum Industry in Galicia forwarded by J. C. Chambers, undated, about 1887; trade-marks and patent papers, Edmund Jussen, U.S. Consul-General, Vienna, to F. W. Lockwood, agent, American Petroleum Export Association, Oct. 19, 1885.

To hold the string of percussion tools suspended in the bore hole, Canadian drillers used ash poles instead of the manila cable preferred in the United States. By means of attached threaded end-pieces the poles were screwed together. This was the method McGarvey took to Galicia.

26. *N. Y. Sen. Rept. No. 50 (1888)*, 421; *U.S. Consular Reports*, 1885-1889, *passim*; Rockefeller Recs., Folger to Rockefeller, Mar. 4, 1892, enclosure of "Refined Oil Statistics America and Russia," 1888-1891.

The statistics presented by Folger do not take into account the small exports from other nations with petroleum production. Here as in other places statistics have been converted to 42-gallon barrels.

27. The following paragraphs are based largely on: Boverton Redwood, "The Russian Petroleum Industry," *The Journal of the Society of the Chemical Industry*, IV, No. 2 (Feb. 28, 1885), 70-81; Dmitri Mendeleeff, "The Present Position and Prospects of the Caucasian Petroleum Industry," *ibid.*, VIII, No. 10 (Oct. 31, 1889), 753-757; *ibid.*, XIII, No. 8 (Aug. 31, 1894), 794-796, citing M. P. de Boissieu, "Present State of the Petroleum Industry," *Bull. Soc. Chim.*, II (1894), 453; Samuel P. Sadtler, "Russian and American Petroleum," *The Journal of the Franklin Institute*, CXXV, No. 5 (May 5, 1888), 364-375; A. B. Thompson, *The Oil Fields of Russia* (London, 2nd ed., 1908); James Dodds Henry, *Baku* (London, 1905); *U.S. Consular Reports*, No. 1 (Oct., 1880), 149; No. 64 (June, 1886), 169, 183; No. 74 (Feb., 1887), 402, 410, 412-413, 416; No. 75 (Mar., 1887), 550-551; No. 79 (June, 1887), 522-526; No. 92 (Apr., 1888),

9; No. 116 (May, 1890), 91-92, 98; No. 120 (Sept., 1890), 186-187; *Engineering* (London), XXXVII (Jan. 11, 1884), 172-173; (Mar. 21, 1884), 259; (Mar. 28, 1884), 286; (Apr. 4, 1884), 301-302; (Apr. 18, 1884), 329, 330; (May 2, 1884), 378; XLII (Nov. 12, 1886), 489 ff; XLV (Apr. 20, 1888), 396; XLVI (Dec. 14, 1888), 589; XLVII (Feb. 8, 1889), 130-133; Paul Dvorkovitz, "The Romance of the Petroleum Industry," *Petroleum Review*, XXX, No. 610 (Mar. 28, 1914), 347-348; "The Late Baron Alphonse de Rothschild," *ibid.*, XII, No. 326 (June 3, 1905), 425; D. Ghambashidze, "The Russian Petroleum Industry and Its Prospects," *The Journal of the Institute of Petroleum Technologists*, IV (1917), 182.

28. *The Journal of the Society of the Chemical Industry*, III, No. 2 (Feb. 29, 1884), 101, citing *Dingl. Polyt. Jour.*, 250, 409, on "Kumberg's New Petroleum Lamps"; *The Journal of the Society of the Chemical Industry*, V, No. 9 (Sept. 29, 1886), 477-480, citing C. Engler and I. Levin, "Comparison between Caucasian and American Petroleum," *Dingl. Polyt. Jour.*, 261, 29-34; *U.S. Consular Reports*, No. 61 (Feb., 1886), 256; No. 95 (July, 1888), 46; No. 109 (Oct., 1889), 324; "The International Petroleum Exhibition," *Engineering* (London), XLIV (Dec. 16, 1887), 633.

29. *U.S. Consular Reports*, No. 74 (Feb., 1887), 416; No. 75 (Mar., 1887), 550-551; and No. 116 (May, 1890), 100; Rockefeller Recs., Archbold to Rockefeller, Aug. 19, 1884.

30. W. H. Libby to S. S. Cox, Mar. 27, 1886, *U.S. Consular Report*, No. 63 (Apr., 1886), 159.

31. Most of the material for this section is based on a study of SONJ, ETC Minutes, 1887-1888, *passim*; Consol. Accts. of S. O. Trust, 1882-1888; *U.S. Consular Reports*, 1883-1888, *passim*; *Oil, Paint & Drug Reporter*, 1883-1888, *passim.*

32. Rockefeller Recs., W. G. Warden to Rockefeller, Nov. 9, 1883; George Henry Funck to Warden, Oct. 26, 1883; H. C. Folger, Jr., to A. M. McGregor, Aug. 5, 1886.

33. *U.S. Consular Reports*, "Petroleum and Kerosene Oil in Foreign Countries," Part I, "Petroleum in the Orient," No. 37 (Jan., 1884), vi, 399-547; No. 19 (May, 1882), 8; No. 24 (Oct., 1882), 408-409; No. 25 (Nov., 1882), 7-9.

34. *Ibid.*, No. 42 (June, 1884), 97, 99-102.

35. *Ibid.*, No. 37 (Jan., 1884), 406.

36. Export Trade Recs., T. C. Bushnell to Libby, Jan. 5, 1895; Libby to W. C. Teagle, Dec. 4, 1913; *The Journal of the Society of the Chemical Industry*, XI, No. 1 (1892), 67, citing Report by C. Lavollée for the Committee of Commerce, *Bulletin de la Société d'Encouragement pour l'Industrie Nationale*, 1891, 6, 277-284.

The French tariff rates of 1881 were 18 cents on crude petroleum and 25 cents on kerosene. In spite of the differential, the prices of French refiners were high enough to enable the Americans to ship some kerosene to France. Much of the so-called crude oil imports were "topped" in the United States, that is, the naphtha was distilled off.

37. SONJ, ETC Minutes, 1887-1888, *passim*; Consol. Accts. of S. O. Trust, 1885-1886. "Adventures in the name of T. C. Bushnell" showed losses of $59,547 and $43,403 in 1885 and 1886, respectively.

38. The account had been on the books of Devoe prior to 1887. The Standard Oil companies in the pool were Bush & Denslow Manufacturing Co., Empire Limited, Central Refining, and Devoe. At this time Jersey Standard delivered oil for canning to Devoe. The other three refiners in the pool were Lombard, Ayres, Chester Oil Co., and Tide Water Oil Co.

39. ETC Minutes, 1887-1888, *passim*; Rockefeller Recs., T. C. Bushnell to Rockefeller, July 18, 1884; Archbold to Rockefeller, Oct. 13, 1885; *N. Y. Sen. Rept. No. 50* (*1888*), 428; above, Chapter 4, section entitled "Organizing the Domestic Market."

Bushnell wrote: "The general feeling —of which I share the same—among our people, is, not to hold on at these prices without business."

40. Rockefeller Recs., Paul Babcock to Rockefeller, Oct. 26, 1889.

41. ETC Minutes, Nov. 26, 1887.

42. *Ibid.*, Sept. 8, 9, 1887, Mar. 9, 20, 1888.

43. Rockefeller Recs., Archbold to Rockefeller, Sept. 29, 1884; *Oil, Paint & Drug Reporter,* XXV, No. 5 (Jan. 30, 1884), 7, 34; No. 9 (Feb. 27, 1884), 13; No. 10 (Mar. 5, 1884), 13; No. 11 (Mar. 12, 1884), 10; and No. 12 (Mar. 19, 1884), 36.

44. SONJ, contract between Joseph Morgan & Son and Standard Oil Co. (N. J.), Dec. 31, 1899, which refers to terms of earlier contracts; Redwood, *Cantor Lectures,* 67-68.

45. ETC Minutes, 1887-1888, *passim*; Socony P. P. Co. Recs., Barstow to Veit, Mar. 28, 1885, July 23, 1886; Barstow to J. G. Newcomb, July 17, 1885; Wheeler to Hopper, July 18, 1889; Rockefeller Recs., McGregor to Rockefeller, Aug. 7, 1884; McGregor memo, Mar. 15, 1886; Archbold to Rockefeller, July 19, 1886.

Barrels filled from one tank bore the same date; a switch to another tank was indicated by a new date on the barrelhead.

46. ETC Minutes, Dec. 23, 1887 (quotation), Jan. 21, 1888; *Oil, Paint & Drug Reporter,* XXXIII, No. 5 (Feb. 1, 1888), 9.

47. Socony P. P. Co. Recs., Wheeler to Hopper, Aug. 23, 1884, to Aug. 11, 1887.

48. *Ibid.*, Wheeler to Hopper, June 18, 1891.

49. *Oil, Paint & Drug Reporter,* XXV, No. 13 (Mar. 26, 1884), 9; XXXI-XXXIII (1887-1888), *passim*; XXXIII, No. 4 (Jan. 25, 1888), 9, 11; No. 7 (Feb. 15, 1888), 7; No. 8 (Feb. 22, 1888), 5-6, 51 (quotation); XXXIV, No. 11 (Sept. 12, 1888), 6-7; XXXVII, No. 1 (Jan. 1, 1890), 60; Rockefeller Recs., Waring to Rockefeller, Apr. 23, 1892.

In September, 1888, it was reported that in order to carry out the agreements of the previous March, the Scotch shale manufacturers had reduced their output by 12½%.

In 1892 Standard Oil's production of crude scale wax of 117° melting point and upward was about 52,000 tons, of which 23,400 tons went to the market of the United Kingdom. This market consumed 53,900 tons (including that for its export trade). The Mineral Oil Association supplied 22,000 tons, other Scotch producers 3,000 tons, and outside-Standard Oil American refiners 5,500 tons.

50. Folger, *Petroleum,* 198. The average price per pound in 1881 was 8.1 cents, while it was 5.6 cents in 1891.

51. Archbold Recs., Report on the Petroleum Industry in Galicia forwarded by J. C. Chambers, undated, about 1887 (quotation); Rockefeller Recs., Rockefeller to O. H. Payne, Jan. 30, 1883, and Rockefeller to W. P. Thompson, Feb. 10, 1885; *U.S. Consular Reports,* No. 4 (Feb., 1881), 246-247; No. 64 (June, 1886), 152-153; and No. 83 (Sept., 1887), 409-411; Redwood, "The Galician Petroleum and Ozokerite Industries," 93-112.

52. ETC Minutes, Sept. 6, Nov. 7, 10, 21, Dec. 22, 1887, Mar. 9, 1888; Rockefeller Recs., Archbold to Rockefeller, July 7, 10, 1884.

53. "Review of the Petroleum Industry," *The Journal of the Society of the Chemical Industry,* VIII, No. 10 (Oct. 31, 1889), 840.

54. Rockefeller Recs., W. G. Warden to Rockefeller, Feb. 5, 1881; McGregor to Rockefeller, Sept. 4, 1884; Archbold to Rockefeller, Oct. 9, 1885; SONJ, Consol. Accts. of S. O. Trust, 1881-1889; James Dodds Henry, *Thirty-five Years of Oil Transport, The Evolution of the Tank Steamer* (London, 1907), 6-10; U.S. Patent Records, No. 326,344; *Oil, Paint & Drug Reporter,* XXV, No. 3 (Jan. 16, 1884), 10; XXVI, No. 15 (Oct. 8, 1884), 28; Folger, *op. cit.*, 124.

55. "Petroleum Steamers for the Black Sea," *Engineering* (London), XL (Sept. 25, 1885), 308, and XLIV (Oct. 28, 1887), 467; *U.S. Consular Reports,* No. 63 (Apr., 1886), 168; No. 64 (June, 1886), 170-171; and No. 73 (Jan., 1887), 67-68.

56. Herbert Barringer, "The Evolution of the Oil Tank-Ship," *Journal of the Institute of Petroleum Technologists,* I (1914-1915), 282-287 and 317; "The

Origin of the Tank Steamship," *Standard Oil Bulletin* [monthly publication of the Standard Oil Co. (Cal.)], III (Feb., 1916), 3-6, based upon a letter of W. A. Riedemann and the *New York Journal of Commerce,* Aug. 13, 1886; W. A. Riedemann, "The Advent of the Bulk Oil-Carrying Steamers," *Petroleum Review,* XXII, No. 478 (June 4, 1910), 315-316.

57. *Oil, Paint & Drug Reporter*, XXXIII, No. 14 (Apr. 4, 1888), 9; No. 24 (June 13, 1888), 6; XXXIV, No. 18 (Oct. 31, 1888), 10-11; and No. 20 (Nov. 14, 1888), 7 and 10; Folger, *op. cit.,* 124, 128-129.

58. Rockefeller Recs., Rockefeller to Executive Committee, June 6, 1885.

59. *Ibid.,* Archbold to Rockefeller, July 31, 1888; Rockefeller to Archbold, Aug. 6, 1888.

60. SONJ, copy of memorandum of association of Anglo-American Oil Co., Ltd., Apr. 24, 1888; Salary Bks. A and B, and morgued Corp. Reg. and Record on Anglo-American; Rockefeller Recs., W. H. Tilford to Rockefeller, July 24, 1890.

Financed by New York Standard, Anglo-American was transferred to a direct holding by the Trust in 1889. The Englishmen were Richard Schade, Francis Frederick Sherriff, Charles Edmund Ward, and Henry Joseph Hall.

61. SONJ, Consol. Accts. of S. O. Trust, 1889-1891; balance sheets of Anglo-American Oil Co., Ltd., and of steamships, 1890-1891; "Memo. of Total Deliveries by Anglo-American Oil Co., Ltd., 1889 to 1896"; *Engineering* (London), XLI (Mar. 19, 1886), 282; LII (July 31, 1891), 138-139.

62. Export Trade Recs., Libby to T. C. Bushnell, May 22, 1893.

63. SONJ, Consol. Accts. of S. O. Trust, 1890-1891; balance sheets of DAPG, May 13, June 30, 1890; Secy. Dept., morgued charter of DAPG; F. Bachof, unpublished "History of the Deutsch-Amerikanische Petroleum-Gesellschaft" (hereinafter cited as "History of DAPG"), including copy of contract signed by Libby, F. E. Schütte, C. Schütte, and H. C. Weigand, Feb. 22, 1890, and *passim.*

64. Export Trade Recs., summary of letters to and from Libby, Bremen, June 10, July 1, 14, 1890; copy of memorandum of agreement, June 19, 1890; copy of agreement, Apr. 17, 1891; F. W. Randebrock to Livingston Roe, Aug. 25, 1893; copy of statutes of the American Petroleum Co., 1891; *Oil, Paint & Drug Reporter,* XLII, No. 18 (Oct. 31, 1892), 52.

65. Export Trade Recs., copy of statutes of the American Petroleum Co., 1891.

66. SONJ, morgued Corp. Recs.; Consol. Accts. of S. O. Trust, 1891; Taylor, *op. cit.,* 285; *The Lamp,* III, No. 6 (Apr., 1921), 13.

67. Socony Recs., New York Standard Minute Bk., 49; *Det Danske Petroleums-Aktieselskab* (published by the company, n.d.); *The Lamp,* IV, No. 1 (June, 1921), 15-16.

68. Rockefeller Recs., Frank Rockefeller to John D. Rockefeller, Oct. 17, 1888, July 16, 1890; SONJ, Consol. Accts. of S. O. Trust, 1888-1891; data on The Imperial Oil Co., Ltd., furnished by J. S. Ewing.

69. SONJ, Consol. Accts. of S. O. Trust, 1890-1891.

70. SONJ, trial balance of Meissner, Ackermann & Co., Mar. 15, 1890, and letters.

71. Export Trade Recs., Libby to W. W Phelps, Sept. 19, 1891.

72. Rockefeller Recs., Folger to Rockefeller, Mar. 4, 1892, and enclosed "Refined Oil Statistics America and Russia"; *Mineral Resources, 1897,* 12.

Folger's statistics did not include the small export trade of petroleum refiners in other countries.

73. *Ibid.*

CHAPTER 6

1. Derrick's *Handbook,* I, 794-795; *Mineral Resources, 1886,* 390, 459, and *1894,* 348-349.

2. Rockefeller Recs.

3. *Ibid.,* Squire to O'Day, Feb. 25, 1886; Derrick's *Handbook,* I, 794.

4. *Mineral Resources, 1886,* 459-460,

and *1889-1890*, 289; data on Imperial Oil furnished by J. S. Ewing.

One analysis of Lima crude which appeared in the *Journal of the American Chemical Society* showed a yield of 68% of illuminating oil, but that figure was never reached by commercial refineries.

5. Rockefeller Recs., Brewster to Rockefeller, June 30, 1886.

6. *Ibid.*, 1886, *passim*; SONJ, Consol. Accts. of S. O. Trust, 1886.

7. SONJ, Consol. Accts. of S. O. Trust, 1886, 1888; Taylor, "History of Standard Oil Co.," 307-308; Derrick's *Handbook*, I, 436, 437; *Oil, Paint & Drug Reporter*, XXXIII, No. 4 (Jan. 25, 1888), 9, and No. 22 (May 30, 1888), 8.

National Transit took 1,965 shares of The Buckeye Pipe Line out of the original 2,000 valued at $50 each, the remainder going to subscribers to qualify them as directors.

8. Derrick's *Handbook*, I, 458, 777.

Drilling in the Lima-Indiana field was relatively easy. The Trenton limestone, the oil-yielding horizon, lay only 1,200 to 1,300 feet below the surface. Intervening strata were not particularly hard. Enough wood was available for derricks. Prices of casing and tubing had remained low since the collapse of a combination of manufacturers in 1884. The average cost of drilling a well in northwestern Ohio was less than $2,500, and many wells were large producers of oil in 1887 and 1888. In 1886 the approximate cost of drilling wells in the Bradford field ranged from a minimum of $2,120 to a maximum of $2,923, and in Washington County, Pennsylvania, from $7,985 to $9,141. With flowing wells and fewer dry holes Lima producers had a marked cost advantage over even their Bradford competitors. (Stoop, "Rapport," 94-97; *Mineral Resources, 1890*, 324, and *1897*, 87; Derrick's *Handbook*, I, 345, 366, 375.)

9. Rockefeller Recs., Squire to Rockefeller, July 2, 1886; Perkin Medal Address, Jan. 19, 1912, *Journal of the Society of the Chemical Industry*, XXXI (Feb. 29, 1912), 169-171; U.S. Patent Records; Canadian Patent Records; data on Imperial Oil furnished by J. S. Ewing.

Professor Chandler in his Perkin Medal presentation speech stated that the purchaser of Frasch's first patent for manufacturing paraffin was the Cleveland Petroleum Co., of which we know nothing. Frasch's patents in the U.S. up to 1887 in relation to petroleum were: Nos. 190,483, 205,792, 231,420, 281,045, 304,-309, and 340,499. The Canadian patents for the same period were: Nos. 7,691, 9,438, 12,641, 15,110, 15,111, 15,959, 15,960, 19,189, 22,663, 24,034, and 27,033.

In addition to his work in the petroleum industry Frasch had patents for making oil lamps, white lead, salt, carbonate of soda, carbon for use in electric lights and thermal electric generators, waxed paper (1884), and for the extraction and manufacture of sulphur. In connection with the last-named, Frasch later perfected means of mining sulphur on a large scale as well as the refining and distribution of it. He was the chief spirit in the organization of The Union Sulphur Co., which quickly developed an international business.

10. U.S. Patent Recs., No. 378,246.

11. Rockefeller Recs., Rockefeller to Archbold, June 3, 1886 (quotation); SONJ, Consol. Accts. of S. O. Trust, 1886-1890, and morgued Corp. Recs.; Taylor, *op. cit.*, 369-371; Derrick's *Handbook*, I, 459, 467.

The authorized capital of the North Western Ohio Natural Gas Co. was raised from an original $200,000 to $6,000,000 by May 13, 1889. On Dec. 31, 1891, National Transit owned 32,786 shares out of the 55,505 issued to that date. By the end of 1891 the North Western Ohio also had leases and producing lands in Essex Co., Canada, valued at $13,650.

12. Rockefeller Recs., O'Day to Rockefeller, Aug. 2, 1886; Taylor, *op. cit.*, 198; Derrick's *Handbook*, I, 435; SONJ, trademark and patent papers; Consol. Accts. of S. O. Trust, 1887; letters to and from B. H. Lepley (hereinafter cited as Lepley Recs.), B. H. Lepley to C. O. Meyer, Oct. 2, 1923; *The Lamp*, II, No. 1 (May, 1919), 25, and VI, No. 1 (June, 1923), 6. McGowan's patent was No. 257,961, a process for desulphurizing petroleum by the simultaneous introduction of oxygen and alkali into the crude oil dur-

ing distillation. Robinson graduated from Cornell in 1884.

13. Rockefeller Recs., June-July, 1888, *passim*; and Monthly Form Reports, W. E. Bemis, 1891; SONJ, Consol. Accts. of S. O. Trust, 1887-1891, and misc. accts.; Salary Bks. A and B; Derrick's *Handbook*, I, 452, 456, 518; *House Trust Investigation, 1888*, 283-284, 305-306; *Mineral Resources, 1885*, 151; *Oil, Paint & Drug Reporter*, XXXIII, No. 14 (Apr. 4, 1888), 7, and XXXIV, No. 5 (Aug. 1, 1888), 8; C. P. Dudley, "Fuel Oil," *Journal of the Franklin Institute*, CXXV, No. 2 (Aug., 1888), 81-95.

In Jan., 1891, John P. Zane of Bradford reported that the consumption of Lima crude for fuel purposes amounted to 25,000 barrels daily.

Among Standard Oil customers for fuel oil were the Cleveland Refining Co., American Wire Co., Standard Carbon Co., and Otis Steel Co. at Cleveland, Maumee Rolling Mill Co. at Toledo, Chicago Steel Works, Chicago Glass Manufacturing Co., and Union Steel Works (largest single user—1,000 barrels per day) at Chicago, Illinois Steel Co. at Milwaukee, American Tube & Iron Co. at Youngstown, and the Niles Tool Works in Michigan. The majority of sales were in the quadrangle north of the Ohio and east of the Mississippi, but many were effected in the South and in the west north central states.

The Pennsylvania Railroad Co. sent Dr. Charles P. Dudley to the Caucasus to study Russian use of fuel oil in locomotives in 1886. His experimental runs in the United States proved that the method of burning the oil as fuel was a success but that coal was less expensive. Among other railroads trying the method were the Rockaway Beach and the Manhattan Elevated. In California the Central Pacific burned oil as fuel in ferry steamers on San Francisco Bay as early as 1885, and other freight and river steamers in the area also used it.

14. Unless otherwise specified, data on Frasch's operations came from the following sources: U.S. Patent Recs., Nos. 418,315 and 448,480; Canadian Patent Recs., Nos. 37,266-37,273; *U.S.* v. *SONJ*, XVI, 2634 (Burton testimony); Rockefeller Recs., 1888-1891, *passim*; SONJ, Consol. Accts. of S. O. Trust, 1888-1891; morgued file on patent matters, Bakewell & Sons (patent attorneys, Pittsburgh) to Manufacturing Committee, Apr. 30, 1891; F. B. Squire to F. Q. Barstow, Jan. 12, Feb. 20, 1891; Squire to McGregor, Oct. 8, 1894; Frasch to McGregor, Sept. 28, 1894; Bakewell & Sons to Squire, Oct. 6, 1894; McGregor to Folger, undated; Lepley Recs., B. H. Lepley to C. O. Meyer, Oct. 2, 1923; data on Imperial Oil furnished by J. S. Ewing.

15. Rockefeller Recs., Squire to Rockefeller, Oct. 13, 1888.

16. *Ibid.*, Barstow to Rockefeller, Aug. 4, 1890, and enclosed note to the Executive Committee, same date, from Ohio Standard.

17. Nevins, *Rockefeller*, II, 9-10; *U.S.* v. *SONJ*, XVI, 2635, 2637, 2654, and XIX, 666; F. L. Babcock, *The First Fifty, 1889-1939* [Chicago, Standard Oil Co. (Indiana), 1939], 1-9; Taylor, *op. cit.*, 199.

The original subscribers of Indiana Standard were W. H. Tilford, A. M. McGregor, F. Q. Barstow, G. H. Vilas, and W. P. Cowan.

18. Rockefeller Recs., Archbold to Rockefeller, June 15, 1891.

19. SONJ, Consol. Accts. of S. O. Trust, 1886-1891. Solar's accounts for the years 1888-1891 showed $167,687 for Frasch's experiments.

20. SONJ, Consol. Accts. of S. O. Trust, 1891; Taylor, *op. cit.*, 303-305, 309-320. The Connecting Pipe Line Co. was organized in 1888 with a capital of $170,000 subscribed for by George Chesebro' of National Transit, William Fleming, William Rockefeller, and three Ohio Standard men.

The Cygnet Pipe Line Co. was organized in 1889. L. H. Severance took 11,950 shares for National Transit, and the other five subscribers were identical to those subscribing for Connecting shares.

21. Rockefeller Recs., Archbold to Rockefeller, Sept. 22, 1890.

22. The profits for 1892 and 1893 were

somewhat higher, being 15.237% and 17.254% respectively.

CHAPTER 7

1. SONJ, Consol. Accts. of the S. O. Trust, 1881-1884; Certificate Bk. of the Germania Mining Co.; Stock Ledger and Certificate Bk. of the Producers' Consolidated Land & Petroleum Co.; Derrick's *Handbook,* I, 322; Taylor, "History of Standard Oil Co.," 130, 157-158.

2. SONJ, Consol. Accts. of S. O. Trust, 1885-1890; Ohio Standard Minute Bk. (quotation); Derrick's *Handbook,* I, 317, 321, 349, 375.

3. Rockefeller Recs., Archbold to Rockefeller, Sept. 23, 25 (quotation), 29 (quotation), 1884; Flagler to Rockefeller, Sept. 20, 1884; Vandergrift and O'Day to Rockefeller, Sept. 24, 1884; *Brief History of Tide Water Companies,* 40, 46; *Autobiography of an Oil Company,* 26.

4. SONJ, Certificate Bk., Letter Bks., Journal, misc. papers, and Minute Bk. of the West Virginia Oil Co., including articles of incorporation, assignment of land, leases of S. P. Wells & Co. refinery, and authorization to buy properties of the West Virginia Transportation Co.; Whiteshot, *Oil-Well Driller,* 66-67.

The Shattuck–B. & O. group was made up of Robert Garrett, Samuel Spencer, John K. Cowan, H. G. Vickery, Thomas Deford, Alexander Shaw, John Merriman & Co., and Shattuck.

5. Frank A. Howard, "Oil's Place in the Artificial Gas Business," *The Lamp,* III, No. 1 (June, 1920), 24-25.

In the water-gas process, which was extensively utilized by the 1880's, hard coal was heated to incandescence, then exposed to a blast of steam. As a result of that action, involving the decomposition of steam and coal, a combustible gas was produced. This first gas was usually carbureted with gas oil or gas naphtha to make a commercial illuminating gas. The plant for its manufacture was cheaper and more compact than that using the old coal gas process.

6. Interview of R. W. Hidy with Christy Payne, son of C. N. Payne, 1949; *Pet. Ind.,* 40-41, 71, and 75; Letter Book of S. C. T. Dodd (hereinafter cited as Dodd Recs.), S. C. T. Dodd to C. N. Payne, Oct. 30, 1902.

7. Rockefeller Recs., O'Day to Rockefeller, 1882-1886, *passim.*

8. *Ibid.,* O'Day to Rockefeller, Mar. 21, 1882, Aug. 16, 1884, Aug. 29, 1885; McGregor to Rockefeller, Nov. 24, 1883.

9. Ibid., Archbold to O'Day, Dec. 12, 1883; Rockefeller to O'Day, Aug. 15, 26, 1884, June 1, 1885, July 14, 1886 (quotations in order from last three letters).

10. *Ibid.,* O'Day to Rockefeller, Aug. 16, 1884, June 18, July 1, Aug. 14, 29, 1885, Oct. 11, 16, 1886; SONJ, Consol Accts. of S. O. Trust, 1885-1888; Taylor, *op. cit.,* 353-358, 364, 368-370; morgued corporation charters; information from Christy Payne, April, 1954.

On Oct. 11, 1886, O'Day wrote, "It is wise for us to have parties associated with us locally."

The chief municipalities served were: Buffalo, Cooperstown, Salamanca, Olean, and Jamestown in New York, Bradford, Fairport, Oil City, Franklin, Titusville, Meadville, Corry, Clarendon, Erie, Warren, Russell, and Sharon in Pennsylvania, and Youngstown, Toledo, and smaller communities in Ohio.

11. Rockefeller Recs., B. Brewster to Rockefeller, June 25, 1888; Taylor, *op. cit.,* 357-358.

12. Rockefeller Recs., W. P. Thompson to Rockefeller, July 21, 1886; Archbold to Rockefeller, June 27, 1888; B. Brewster to Rockefeller, June 25, 1888, and telegrams June 6, 26, 1888; O'Day to Rogers, July 29, 1889; SONJ, Consol. Accts. of the S. O. Trust, 1888-1891.

13. *N. Y. Sen. Rept. No. 50 (1888),* 386.

14. See Chapter 4, section entitled "National Transit in Action."

15. Rockefeller Recs., 1884-1885, *passim;* Rockefeller to Brewster, July 28, 1884; Brewster to Rockefeller, Aug. 9, 1884; Rockefeller to Archbold, Oct. 16, 22, 1884; Rockefeller to Folger, Sept. 18, 1885; Flagler to Rockefeller, July 3, 1885 (quotation); Rockefeller to Flagler, July 3, 1885; Rockefeller to Pratt, June 26, 1885.

16. *Ibid.*, Brewster to Rockefeller, Oct. 14, 1885; Comfort to Archbold, June 27, 1885; *Mineral Resources, 1892,* 610 (Charles Ashburner).

17. Rockefeller Recs., C. Pratt to Rockefeller, June 29, 1885.

18. *Ibid.*, Flagler to Rockefeller, June 26, 1885; telegram from Executive Committee, July 15, 1886.

19. *House Trust Investigation, 1888,* 112-114, Testimony of Thomas W. Phillips. Stoop, "Rapport," 106, observed that producers had given little attention to the average total production of individual wells, and testimony of witnesses before congressional bodies in both 1888 and 1899 betrayed marked limitations in accounting methods among producers.

20. For a more detailed discussion, see Chapter 8.

21. Rockefeller Recs., Rockefeller to W. H. Johnson, Feb. 25, 1887; Derrick's *Handbook*, I, 43, 450-453.

22. *House Trust Investigation, 1888,* 1-73, Testimony of Henry Webster, I. B. Bennett, David Kirk, and James R. Goldsborough; Derrick's *Handbook*, I, 487, 493; *Oil, Paint & Drug Reporter,* XXXIII-XXXIV (1888), *passim.*

Three different kinds of contracts were signed by participants in the curtailment program. Some producers agreed to curtail existing production, others agreed not to start new production, and a third group agreed not to increase their existing production. Within a day after the curtailment began on Nov. 1, contractors and drillers in the Bradford field made a loud protest at being left out of consideration. The Well Drillers' Association was immediately formed and a contract, predated to Nov. 1, was negotiated with New York Standard for holding 1,000,000 barrels of oil on their behalf, in addition to the 5,000,000 previously arranged. The producers reserved the profits on 1,000,000 of the original 5,000,000 barrels for payments to their own employees. During the period of the agreement the average monthly price ranged from 80⅜ to 93⅝ cents per barrel.

23. Rockefeller Recs., Rockefeller to Archbold, Sept. 13, 1888; *N. Y. Sen. Rept. No. 50 (1888)*, 449 (quotation from Archbold).

24. Rockefeller Recs., Warden to Rockefeller, May 24, 1887.

25. *Ibid.*, Flagler to Rockefeller, Sept. 7, 1887, quoting Scheide's letter; telegram, Archbold to Rockefeller, Sept. 13, n.d.; Archbold to Rockefeller, July 1, 1889 (quotation).

26. *Oil, Paint & Drug Reporter,* XXXIV, No. 22 (Nov. 28, 1888), 40.

27. Rockefeller Recs., A. Lewis to Rockefeller, June 1, Aug. 25, 1888; Pratt to Rockefeller, Aug. 25, 1888; Archbold to Rockefeller, Aug. 27, 30, 1888.

28. *Ibid.*, Pratt to Rockefeller, Aug. 25, Sept. 1 (quotation), 13, 24, Oct. 19, 1888.

29. *U.S.* v. *SONJ*, XVII, 3247 (Archbold).

30. Rockefeller Recs., Bostwick to Rockefeller and Executive Committee, Feb. 27, 1886.

31. *Ibid.*, O'Day to Rockefeller, July 6, 1888; Scheide to Rockefeller, Aug. 6, 1886; O'Day to Rockefeller, Jan. 15, 1889 (quotation); Scheide to Rockefeller, May 24, 1888 (quotation); J. Bushnell to Rockefeller, Sept. 13, 1887.

32. *Ibid.*, Scheide to Rockefeller, May 24, 1888.

33. *Ibid.*, 1888-1889, *passim*; SONJ, accts. of S. O. Trust, balance sheet of North Penn Oil Co., Dec. 31, 1890; *U.S.* v. *SONJ*, XVII, 3247 (Archbold); Taylor, *op. cit.*, 336-341.

The Washington Oil Co., incorporated in Pennsylvania on Oct. 11, 1887, was capitalized originally at $500,000 (10,000 shares at $50 each). By the end of 1889 Standard Oil held 4,530 out of 17,424 shares issued.

The North Penn Oil Co. was organized with an authorized capital of $2,000,000 in 1888 or 1889. The original incorporators were C. N. Payne, Joseph Seep, E. Strong, Henry M. McSweeney, and George Lewis.

The South Penn Oil Co., capitalized at $2,000,000, was organized on May 27, 1889. The original incorporators were Daniel O'Day, J. R. Campbell, Wade Hampton, Jr., Frank Loomis, Millard Scheide, and N. F. Clark.

34. SONJ, Consol. Accts. of S. O. Trust, 1888-1891, and morgued Corp. Recs.; *A History of The Ohio Oil Company: Sixty Years of Progress, 1887-1947* (n.p., 1947), 10-15; Taylor, *op. cit.*, 348-349.

The Ohio Oil Co. was organized by W. H. Mandeville, G. G. Goss, James McCormick, S. M. Jones, and J. C. Lineman. When Standard Oil took over in June, 1889, the new directors were Fleming, Archbold, J. C. Donnell, C. F. Lufkin, and Thomas A. McLaughlin.

35. SONJ, morgued Corp. Reg. and charters, and Consol. Accts. of S. O. Trust, 1890-1891; Taylor, *op. cit.*, 333-335, 338-339, 343, 347; Derrick's *Handbook*, I, 518, 973.

The authorized capital of the Union Oil Co. was $4,000,000 (40,000 shares), but only 31,610 had been issued at the time of the purchase by Standard Oil interests. The Anchor was a $1,000,000 corporation and the Midland $2,000,000, of which only $1,100,000 had been issued at the time of the Standard Oil purchases. Although the Forest Oil Co. apparently had authority to issue capital stock to the value of $5,500,000 by the end of 1891, only 31,832 shares out of a possible 55,000 had been issued by Apr. 1, 1891, when the National Transit Co. acquired 16,018 shares through John D. Archbold's special account. Forest Oil Co.'s balance sheet for June 30, 1890, also showed ownership of 585 shares in the Taylorstown Natural Gas Co., 1,000 shares in the Washington Oil Co., and 1,428 shares in the North Western Ohio Natural Gas Co.

On July 15, 1890, the Trustees purchased from the Union Oil Co. 3,566 shares of the Associated Producers' Co. at $80 per share, which were sold on the following Aug. 27 to The Tide-Water Pipe Co., Ltd., for $95 a share. Apparently the shares held since 1884 by the Producers' Consolidated Land & Petroleum Co. had been previously transferred to the Union Oil Co., for they disappear from the balance sheets of the P. C. L. & P. Co.

The Jackson Oil Co. was organized on Dec. 9, 1891, by William Fleming, Joseph Seep, C. N. Payne, E. Strong, N. F. Clark, J. R. Campbell, Millard Scheide, G. P. France, and H. M. McSweeney.

The Marion Oil Co. was a Pennsylvania corporation organized under a charter granted Mar. 19, 1891, with an authorized capital of $1,000,000. Of that total $500,000 was subscribed at the time of the organization on Mar. 26, 1891. N. F. Clark subscribed for one-half of the total for account of unnamed parties, and Fleming, Seep, W. J. Young, Payne, and McSweeney for Standard Oil. In 1903 the owner of the 50% originally subscribed for by Clark was the Enterprise Transit Co.

Until 1892 N. F. Clark was president of South Penn, J. L. McKinney president of Midland, and J. J. Vandergrift president of Forest.

36. Rockefeller Recs., N. F. Clark to Archbold, July 8, 1889; F. Garvin Davenport, "American Geologists and the Oil Industry," *Indiana Magazine of History*, XLVII, No. 1 (Mar. 1951), 30.

37. Rockefeller Recs., Archbold to Rockefeller, July 10, 1890.

38. *Ibid.*, O'Day to Rogers, July 29, 1889; Archbold to Rockefeller, June 25, 30, July 7, 8, 1890 (in order of quotations).

The first Production Committee appears to have been made up of O'Day, Scheide, and Seep.

39. Rockefeller Recs., Archbold to Rockefeller, June 15, 1891.

40. *Mineral Resources, 1898*, 73; *U.S.* v. *SONJ*, XIX, Defendant's Exhibits Nos. 266, 267, and 268; SONJ, collection of predissolution data.

The figures available for Standard Oil's production are those of net production, that is, total production minus royalty oil.

41. Tarbell, *History of the Standard Oil Company*, II, 242; Taylor, *op. cit.*, 305-306, 318, 322; Derrick's *Handbook*, I, 519; Folger, "Petroleum," 53.

The South-West Pennsylvania Pipe Lines, capitalized at $500,000, was organized on Oct. 30, 1885, with National Transit funds by Benjamin Brewster, Daniel O'Day, W. T. Scheide, Joseph Seep, C. N. Payne, and J. R. Campbell. The Eureka Pipe Line Co., a West Virginia corporation, authorized to issue $2,000,000 in stock, was formed on Dec. 22, 1890. The incorporators were O'Day,

Payne, McSweeney, Campbell, and Archbold, who used money furnished by National Transit to subscribe for the first 10,000 shares of $100 each.

National Transit also bought all the 15,000 shares originally issued by the Southern Pipe Line Co., organized on July 15, 1890, by Payne, Seep, William Fleming, Campbell, McSweeney, Flagler, and others. By Feb., 1891, its line was completed from the Pennsylvania–West Virginia border to Millway, where it connected with the main line of the National Transit Co.

Both the South-West and Eureka had gathering systems, but Southern was solely a trunk line.

42. SONJ, Consol. Accts. of S. O. Trust, 1885-1890; Rockcfeller Recs., Pratt to Rockefeller, Sept. 12, 1888. Pratt estimated total Standard Oil crude consumption daily at 61,581 barrels in 1886 and 61,533 in 1887 for years averaging 303 working days.

43. *U.S.* v. *SONJ*, XIX, 660, Defendant's Exhibit No. 276; SONJ, Consol. Accts. of S. O. Trust, 1886-1891; Bayonne Cost & Yield Statements; Rockefeller Recs., Babcock to Rockefeller, Apr. 12, 1886.

44. References for the following two paragraphs: SONJ, Consol. Accts. of S. O. Trust, 1886-1891, and misc. papers; morgued leases, contracts, and agreements, release signed on Nov. 25, 1887, by Lewis Emery, Jr., W. R. Weaver, L. E. Hamsher, and A. H. Logan, and contract between J. D. Platt and Rogers and Archbold, Apr. 3, 1890; Rockefeller Recs., Rogers to Rockefeller, Aug. 31, 1888; Archbold to Rockefeller, Sept. 21, 26, 1888, July 23, 1889; Rockefeller to Rogers, Sept. 5, 1888; Rockefeller to Archbold, July 5, 22, 1889; Socony Recs., Empire Refining Co., Ltd., lease and attached papers, Dec. 1, 1891–Apr. 29, 1901, and Central Refining Co., (N.Y.) papers, Apr. 3, 1890-Apr. 25, 1899; Bayonne Appropriation Bk. and cards; Taylor, *op. cit.*, 202-203, 207-208; Derrick's *Handbook*, I, 466, 468, 491, 499; Whiteshot, *op. cit.*, 719.

The plants of both the Portland Kerosene Oil Co. and the Maverick Oil Co. were partially dismantled and converted into oil yards. The refinery of Pennsylvania Acme at Titusville experienced a severe fire in 1886 and last appeared in the manufacturing analyses of Standard Oil accounts in 1888.

45. Rockefeller Recs., 1886-1891, *passim*; Socony P. P. Co. Recs., circular letters, 1886-1890.

46. SONJ, Bayonne Appropriation Bk.; J. E. Denton, "Mechanical Significance of the Viscosity Determinations of Lubricants," *American Engineer*, XV (June 13, 1888), 208-209, and "History of Attempts to Determine the Relative Value of Lubricants by Mechanical Tests," American Association for the Advancement of Science *Proceedings*, XXXIX (1890), 185-206; Rockefeller Recs., Archbold to Rockefeller, July 1, 1889 (quotation). The articles cited are a selection from Denton's publications. Denton said of the Lubricating Committee of the Standard Oil combination: "The policy of this body is to seek a knowledge of their lubricating products by every method of test which can be regarded as at all capable of leading to definite measures of lubricating values having any tangible mechanical significance, or practically valuable in any reasonable degree." *Proceedings* (1890), 200.

47. C. M. Everest, "Lubricants from a Maker's Standpoint," *Cassier's Magazine*, VII, No. 3 (Jan., 1895), 228-236, being a reprint from *Proceedings of the Division of Marine and Naval Engineering and Naval Architecture* of the International Engineering Congress in Chicago, published by John Wiley & Sons in 1894; *Oil, Paint & Drug Reporter*, XXXIV, No. 20 (Nov. 14, 1888), 6; SONJ, Consol. Accts. of S. O. Trust, 1891; Rockefeller Recs., Squire to Rockefeller, Feb. 4, 1891; memorandum by C. C. Burke, Dec. 15, 1889; Archbold to Rockefeller, Sept. 10, 1890 (quotation).

48. M. Riche et M. Roume, "L'industrie du pétrole aux Etats-Unis d'Amérique," *Annales des Mines*, Series 9, No. 5 (1894), 90-95; SONJ, Consol. Accts. of S. O. Trust, 1885-1891.

49. SONJ, "Memorandum in regard to some of the by-products of petroleum for which the Standard Oil Company has found and developed markets," probably drawn up for the dissolution suit in 1906;

Socony Recs., copy of schedule submitted by the S. O. Trust to the Census Bureau regarding manufacturing operations in 1889. In that year 39,954 tons of acid sludge were sold to fertilizer companies, 6,133 tons were dumped in the Atlantic, and an unrecorded amount sold to manufacturers of sulphuric acid for restoration.

50. SONJ, Consol. Accts. of S. O. Trust, 1885-1891; Bayonne Cost and Yield Statements.

51. Rockefeller Recs., W. H. Tilford to Executive Committee, June 22, 1886; W. G. McKelvey to Warden, Apr. 29, 1885; Warden to McKelvey, May 1, 1885; Rockefeller to Warden, May 2, 1885; Warden to Rockefeller, May 4, 1885 (quotation).

52. *Ibid.*, W. D. Spelman to Rockefeller, Dec. 20, 1889; Archbold to Rockefeller, June 10, 1889.

53. *Ibid.*, Flagler to Rockefeller, Oct. 8, 1885 (quotation); Brewster to Rockefeller, Oct. 19, 1885; Thompson to Rockefeller, Feb. 3, Nov. 12, 1886; Squire to Rockefeller, Nov. 27, 1886; Rockefeller to Archbold, July 17, 1886; Archbold to Rockefeller, Oct. 13, 15, 16, 18, 22, 1886.

54. *Ibid.*, Rockefeller to Archbold, Aug. 20, 1888.

55. *Ibid.*, F. Rockefeller to Rockefeller, Mar. 7, 1887, Jan. 5 (quotation), 1888.

56. *Ibid.*, Archbold to Rockefeller, June 10, 1889; F. Rockefeller to Rockefeller, Jan. 5, 1888, Feb. 25, June 12, 1889; Cowles to Rockefeller, Nov. 16, 1889.

57. *Ibid.*, F. Rockefeller to Rockefeller, Jan. 5, 1888, Feb. 25, 1889, and enclosed undated letter to W. H. Tilford; Thompson to A. McDonald, June 21, 1888.

58. *Ibid.*, H. A. Hutchins to F. Rockefeller, Jan. 18, 1888; F. Rockefeller to Rockefeller, Jan. 20, 1888; Hanford to Hutchins, Nov. 9, 1887; W. H. Tilford to Rockefeller, June 3, 4, 5, 1890.

59. *Ibid.*, F. Rockefeller to Rockefeller, Jan. 20, 1888.

60. *Ibid.*, Thompson to Rockefeller, Nov. 6, 1886, Jan. 24, 1887.

61. *Ibid.*, Thompson to Rockefeller, Sept. 17, 1886; Hanford to Hutchins, Nov. 9, 1887; SONJ, Consol. Accts. of S. O. Trust, 1886-1891, morgued Corp. Recs., and Salary Bks. A & B; Taylor, *op. cit.*, 222-236.

62. SONJ, Consol. Accts. of S. O. Trust, 1883-1891; morgued leases, contracts, and agreements; Taylor, *op. cit.*, 219-220.

New York Acme had owned part of McKirgan Oil Co. until 1883, when it was incorporated. The Trust held the majority of the stock.

63. Socony Recs., copy of the schedule submitted by the S. O. Trust to the Census Bureau regarding manufacturing operations in 1889; annual statistical report on business by all companies in the Standard Oil interests, 1906.

64. SONJ, Consol. Accts. of S. O. Trust, 1891; Soc. P. P. Co. Recs., Wheeler to Hopper, Nov. 30, 1888, Nov. 22, 1889.

65. SONJ, accounting papers of Continental Oil Co., 1890-1891; *Mineral Resources, 1888*, 465-466; Taylor, *op. cit.*, 201; Rockefeller Recs., D. P. Eells to Rockefeller, Jan. 24, 1889.

The United Oil Co. was organized in July, 1887, with an authorized capital of $3,000,000 in 30,000 shares of $100 each.

66. *House Trust Investigation, 1888*, 539.

67. Rockefeller Recs., O'Day to Rockefeller, Sept. 18, 1886.

68. *Ibid.*, F. B. Squire to Rockefeller, Sept. 25, 1886.

69. *Ibid.*, Archbold to Rockefeller, June 12. Oct. 5, 6, 27, 1886; Hutchins to Rockefeller, Oct. 16, 1886; Squire to Rockefeller, Oct. 7, 8, 29, 1886.

70. *Ibid.*, F. Rockefeller to Rockefeller, Dec. 6, 1887; Thompson to Rockefeller, June 21, 29, 1888; circular letter from Scofield, Shurmer & Teagle, Aug. 23, 1888; Archbold to Rockefeller, Aug. 22, 27, 30, 1888; *Oil, Paint & Drug Reporter*, 1888, *passim*; *Ind. Comm.*, I, 788-789.

Immediately after the Scofield, Shurmer & Teagle decision the railroads set rates slightly higher than had recently prevailed, provided for charging freight on barrels holding oil, and set the accepted weight of refined products at 6½ pounds per gallon.

71. SONJ, Corp. Reg. and Recs., and accounting papers of Ohio Standard, 1890-1891; Taylor, *op. cit.*, 240.

Only Continental and Waters-Pierce still retained a few tank cars in their own names after 1891.

72. *Oil, Paint & Drug Reporter,* XXXIV, No. 5 (Aug. 1, 1888), 8; Socony Recs., copy of schedule submitted by the S. O. Trust to the Census Bureau regarding manufacturing operations in 1889.

73. Rockefeller Recs., 1886-1891, *passim*; Barstow to Rockefeller, July 2, 19, 1886; Thompson to Rockefeller, Feb. 3, Nov. 18, Dec. 18, 1886, Jan. 18, 1887; Squire to Rockefeller, June 27, 1890 (italics authors'), Jan. 9, 1892; Pratt to Rockefeller, Nov. 15, 1890; Flagler to Rockefeller, Aug. 24, 1891.

Pratt's letter listed 21 areas of severest competition. In these Standard Oil's percentage of the market ranged from 53.3% in St. Joseph, Mo., to 84.4% in Richmond, Va. The report showed that Standard Oil had lost ground in 12 of the 21 markets between 1889 and 1890; for example, it had lost an additional 19% of the Kansas City market. In 1891 Standard Oil gained over its record for 1890.

74. Rockefeller Recs., D. S. Cowles to Rockefeller, Jan. 25, 1889, and memo by H. C. Folger, Jr., Feb. 8, 1889.

CHAPTER 8

1. Nevins, *Rockefeller,* II, 37-139.

2. John M. Bonham, "A Brief History of the Standard Oil Trust, Its Methods and Its Influence" (a pamphlet, n.p., n.d., though context indicates publication in 1888 or later).

3. *Oil, Paint & Drug Reporter,* XXI, No. 9 (Mar. 1, 1882), 387.

4. *House Trust Investigation, 1888,* 573-627, 644-651, 739-746; *Mineral Resources, 1894,* 351; *Ind. Comm.,* I, 562, 749-751; George Rice, *Black Death* (a pamphlet, Marietta, O., 1881); *Oil, Paint & Drug Reporter,* XXI, No. 3 (Jan. 18, 1882), 122, and No. 4 (Jan. 25, 1882), 170.

Rice's fly-by-night marketing tactics can be followed by a recording of the areas into which he went, as shown in evidence in *House Trust Investigation, 1888.*

5. Dodd Recs., S. C. T. Dodd to F. T. Gates, June 12, 1905; Dodd, *Memoirs,* 30; *Ind. Comm.,* I, 486; *Oil, Paint & Drug Reporter,* 1882-1884, *passim*; Tarbell, *History of the Standard Oil Co.,* II, 346-347.

In the Industrial Commission Report Patrick Boyle is quoted as saying that Rice leased land across National Transit's projected right of way in 1874, which is apparently a misprint for 1884, because Camden Consolidated did not become a part of Standard Oil until 1875 and National Transit did not enter the Macksburg field with a pipeline earlier than 1883 or 1884.

Dodd's letter to Gates read as follows: "As to the George Rice affair, I can say from personal knowledge that was the only case of the kind brought to my attention during my twenty-five years of connection with the Company. A written agreement was drawn between the Pipe Line Co. and the railroad Receiver and sent here for approval. It was at once condemned and was not executed. This was prior to my knowledge of any legal proceedings against the Receiver."

6. Nevins, *Rockefeller,* II, 110-111. A similar bill to the Billingsley was defeated in the Pennsylvania legislature in 1891.

7. *Ibid.,* II, 76-87; *House Trust Investigation, 1888,* 801-951; Testimony in the Buffalo Lubricating Oil case in the court of Oyer and Terminer in Buffalo; SONJ, E. Prizer to M. F. Elliott, Jan. 19, 1911, covering copy of unaddressed letter of Prizer, Jan. 9, 1911; Dodd Recs., S. C. T. Dodd to Ida Tarbell, Jan. 4, 1904; New York *World,* May 16, 1897; *New York Tribune,* July 31, 1897; *Buffalo Express,* Oct. 20, 1896; *Oil, Paint & Drug Reporter,* XLVI, No. 12 (Sept. 17, 1894).

The leading figure in Buffalo Lubricating, Charles B. Mathews, did not receive a cent from the sale of his works; creditors took everything. He later built a small plant, worth about $15,000, under the name of the Buffalo Refining Co., which was sold to appease creditors in 1897. He was the Populist candidate for governor of New York in 1894 and an ardent Bryan supporter in 1896.

8. Rockefeller Recs., Archbold to Rockefeller, June 30, 1885; *Oil, Paint & Drug*

Reporter, XXXIII, No. 17 (May 23, 1888), 8; SONJ, Salary Bk. A.

9. *George Rice* v. *John D. Rockefeller et al., Trustees,* instituted in the Supreme Court of New York, sitting in New York City, Jan. 21, 1888; Certificate Bk. of S. O. Trust, last certificate, No. 8618; *Oil, Paint & Drug Reporter*, XXXIV, No. 9 (Aug. 29, 1888), 6, and XXXVII, No. 3 (Jan. 15, 1890), 7. The Rice certificate was issued on Oct. 18, 1892, and canceled on Nov. 10, 1911.

10. N. Y. Sen Rept. No. 50 (1888), 10.

11. *Oil, Paint & Drug Reporter*, XXI, No. 3 (Jan. 18, 1882), 122; Rockefeller Recs., Alexander McDonald to Flagler, Dec. 30, 1881. McDonald had regarded Rice's pamphlet as a "blackmailing scheme," but ordered 2,000 copies of Flagler's version.

12. J. C. Welch and J. N. Camden, "The Standard Oil Company," *The North American Review*, CXXXVI, No. 315 (Feb., 1883), 181-200.

13. SONJ, Consol. Accts. of S. O. Trust, Dec. 31, 1881.

14. Rockefeller Recs., Archbold to Rockefeller, July 2, 1885 (quotation); SONJ, miscellaneous papers on loans; Consol. Accts. of S. O. Trust, 1881-1884; *Ind. Comm.*, I, 404, 488; Derrick's *Handbook*, I, 461. Boyle took over the Bradford *Era* in 1887.

15. Rockefeller Recs., Thompson to Rockefeller, Jan. 3, 1887; Flagler to Rockefeller, Aug. 27, 1889.

16. *Ibid.*, Camden to Rockefeller, Mar. 16, 1882; Payne to Rockefeller, Dec. 31, 1884; Babcock to Rockefeller, Mar. 19, 1884.

17. *Ibid.*, Rockefeller to Charles Foster, Jan. 10, 1888.

18. SONJ, morgued leases, contracts, and agreements, discharge and receipt signed by Lewis Emery, Jr., William R. Weaver, and Lewis E. Hamsher, Nov. 25, 1887; Nevins, *op. cit.*, II, 109.

19. Rockefeller Recs., Anderson to Rockefeller, Jan. 8, 1884; Vilas to Rockefeller, Jan. 8, 1884; Babcock to Rockefeller, undated, 1888.

20. *Ibid.*, Warden to Rockefeller, May 24, 1887.

21. See Chapter 7.

22. Tarbell, *op. cit.*, I, 401.

23. Dodd, *Memoirs*, 29-30. "I take advantage of this occasion to assure my children that I have not been inconsistent, and think that I have done as much as any one individual in the United States to stop what I believe to be a public evil," Dodd wrote of his fight against railroad-rate discriminations.

24. *Oil, Paint & Drug Reporter*, XXXIII, No. 5 (Feb. 29, 1888), 5; Rockefeller Recs., Archbold to Rockefeller, July 31, 1888.

25. See Chapter 5.

26. Nevins, *Rockefeller*, II, 141-142; Joseph Dorfman, *The Economic Mind in American Civilization, 1606-1918*, 3 vols. (New York, 1946-1949), III, 127; Chapters 20 and 22 of this volume. There is no reason to doubt Gunton's independence of thought in 1889. During the same year that he defended trusts and combinations at Chautauqua, he prepared for the American Federation of Labor a pamphlet urging the eight-hour day for workers, an idea contrary to Standard Oil practice at the time.

27. *Harper's Weekly*, XXXIII, No. 1 (Sept. 28, 1889), 772-774; Rockefeller Recs., "Dictation by Mr. Rockefeller," Aug. 7, 1889; William Rockefeller to John D. Rockefeller, Sept. 26, 1889.

28. Nevins, *op. cit.*, II, 137-138.

29. 49 Ohio State 137.

30. Unless otherwise specified, data in this section came from a study of SONJ, Consol. Accts. of S. O. Interests, 1891-1899; *Ind. Comm.*, I, *passim*; *U.S.* v. *SONJ*, *passim*; Nevins, *op. cit.*, II, 149-157.

31. SONJ, Consol. Accts. of S. O. Interests, 1891 and 1892.

All stocks of eighteen of the twenty companies were held by the Trustees, except for a few qualifying shares. In the case of the North Western Ohio Natural Gas Co. only 59.3% of the stock was held by the Trust, and hence it was only a portion of that corporation's shares to which the division was applied. The twentieth company, the New York Transit Co., was newly organized.

32. SONJ, Minute Bk., Mar. 4, 5, 17, 29, 1892.
Section 3 of the original certificate of incorporation in 1882 reads as follows:

> The objects for which said Company shall be formed are the refining of petroleum; the manufacturing of the various products thereof; the purchasing of the crude material and sale of the manufactured products thereof; the manufacture of barrels, boxes, cans, and other packages in which the manufactured products may be kept or transported; the manufacture and restoration of acids and whatever substances may be used in the manufacture of the products of petroleum.

To that statement was added on March 5, 1892:

> Also the purchasing, selling and dealing in crude petroleum, and all the products thereof, and all the products obtained by the mixture of petroleum with other products, and all the machinery and materials used in the manufacture of petroleum and any of its products, and any of the combined products aforesaid; and the purchasing, selling and dealing in the cars, pipes, ships and packages in which petroleum and its products are transported and marketed, and in the materials and machinery used in the manufacture of such packages.

The Board of Directors of Jersey Standard, originally five in number, had been reduced to three on January 13, 1891.

33. *U.S. v. SONJ*, VIII, 567-582; SONJ, Certificate Bk. of S. O. Trust; "Statement from Stock Books of Standard Oil Company of New York, Showing all Stockholders of Record between the Dates Indicated, with the amount of the Holdings on the Respective Dates, May 1, 1892-Dec. 26, 1900"; Consol. Accts. of S. O. Interests, 1892, loose-sheet record of assignment certificates issued and canceled; Nevins, *op. cit.*, II, 150.

Some of the 477,881 shares were represented by assignment of legal title to stock in the twenty companies. Before Trust stockholders began to balk at taking shares in the twenty companies, the liquidating trustees had issued assignments of legal title representing 591,996 shares, of which only 494,619 were turned in for cancellation, leaving 97,377 in circulation.

The names of the seventeen were John D. Archbold, Emma B. Auchincloss, William Rockefeller, John D. Rockefeller, W. H. Tilford, Benjamin Brewster, H. M. Flagler, Charles W. Harkness, Annie B. Jennings, Esther J. Jennings, Helen G. Jennings, Oliver G. Jennings, O. B. Jennings, Walter Jennings, O. H. Payne, Estate of Charles Pratt, and H. H. Rogers.

34. *Ind. Comm.*, I, 574.

35. Rockefeller Recs., S. C. T. Dodd to Rockefeller, March 24, 1892; Rockefeller to C. A. Griscom, March 24, 1892; SONJ, Corp. Recs.; *U.S.* v. *SONJ*, XIX, 666-670.

The directors for 1895 not included in Table 23 were as follows: Atlantic Refining, C. E. Bushnell, N. W. Harkness, Clarence Vose; Eureka Pipe, H. M. McSweeney and J. R. Campbell; Forest Oil, J. J. Vandergrift; Indiana Pipe, G. P. France; National Transit, C. A. Griscom; New York Transit, Benjamin Brewster; North Western Ohio Natural Gas, M. B. Daly, J. S. Rodgers and W. L. Harkness; Ohio Oil, J. C. Donnell, C. F. Lufkin, T. A. McLaughlin; Solar Refining, F. G. Borges and J. W. Van Dyke; South Penn, J. C. McKinney and J. L. McKinney; Indiana Standard, W. P. Cowan; Kentucky Standard, E. L. Goodwin and S. H. Paine; Jersey Standard, J. H. Alexander and C. C. Burke; Ohio Standard, Frank Rockefeller; Union Tank Line, Howard Page.

36. Rockefeller Recs., Rockefeller to Babcock, Aug. 8, 1891; Rockefeller to Harold McCormick, June 29, 1907 (quotation); SONJ, M. H. Eames notebook.

Among the important items which Eames recorded in his memory book was the fact that the president did not come to 26 Broadway after early 1896 at the latest.

37. *Oil, Paint & Drug Reporter*, XXV, No. 11 (Mar. 12, 1884), 16, quoting the *New York Tribune*.

38. Rockefeller Recs., Babcock to Rockefeller, June 30, 1892.

39. *Ibid.*, Dodd to Rockefeller, Mar. 24, 1892.

40. SONJ, "Analysis and Classification of Cost of Original Building and of Additional Number 30," Standard Oil Co. of New York office building.

The cost of adding real estate at 30 Broadway and of the new floors was $1,626,893.51.

41. Socony P. P. Co. Recs., *passim*; SONJ, Minute Bk., May 5, 1892; Salary Bks. B and C.

Salaries were carried on the books of Standard Oil Co. of New York, but salaries and expenses were shared with other companies. For example, in 1895, C. M. Coburn's expenses were shared by Jersey Standard, Atlantic Refining, Ohio Standard, and Solar.

CHAPTER 9

1. SONJ, Bayonne Cost & Yield Statements, 1899.

2. Generalizations in this section are drawn from a study of SONJ, Export Trade Recs., 1893-1899, *passim*; collection of newspaper clippings on the petroleum industry, 1892-1899, *passim*; Archbold Recs., W. H. Libby to T. C. Bushnell, May 21, 1897; *U.S. Consular Reports,* 1892-1899, *passim*; *Oil, Paint & Drug Reporter,* 1892-1899, *passim,* especially XLV, No. 26 (June 25, 1894), 18, and XLVI, No. 13 (Sept. 24, 1894), 5; *Engineering,* LXVII (Sept. 9, 1898), 334.

3. The material on Russia is drawn largely from *U.S. Consular Reports,* No. 151 (Apr., 1893), 578-579; No. 165 (June, 1894), 170-172; No. 177 (June, 1895), 318-322; No. 201 (June, 1897), 189-190; No. 212 (May, 1898), 40, 44; No. 225 (June, 1899), 218, 222-223; No. 229 (Oct., 1899), 226-227; report by Bion H. Butler on the Russian petroleum industry in *Pittsburgh Times,* Mar. 2, 1896; Ernest H. Foster, "A Russian Petroleum Pipe Line," *Cassier's Magazine,* XIX, No. 1 (Nov., 1900), 11-16; *Ind. Comm.*, I, 566-567; *Engineering,* LVII (Jan. 5, 1894), 22; Oswald von Brackel and J. Leis, *Der dreiszigjährige Petroleumkrieg* (Berlin, 1903).

4. Export Trade Recs., Libby to T. C. Bushnell, Aug. 23, 1893; Rockefeller Recs., Warden to Rockefeller, Nov. 9, 1883; Archbold to Rockefeller, July 2, 1889, Dec. 15, 1891, July 13, 1892.

5. *Ibid.*, L. Lambert, son-in-law of Baron Alphonse Rothschild, to American Petroleum Co., Dec. 29, 1893; *Ind. Comm.*, I, 566; New York *World,* May 24, 1894; *U.S. Consular Report,* No. 177 (June, 1895), 322.

6. Unless otherwise stated, the material for this section comes from Export Trade Recs., especially correspondence between Libby and T. C. Bushnell, 1893 to 1899, *passim,* and G. F. Southard to T. C. Bushnell, Sept. 15, 1893, Jan. 8, May 11, 1894; James McDonald to G. F. Gregory, Sept. 15, 1893; T. C. Bushnell and James McGee to John Bensinger, Sept. 27, 1893; copy of preliminary contract between Standard Oil Co. of New York and the French Refiners, Dec. 2, 1893; W. Rockefeller to Committee of the French Refiners, May 11, 1894; T. C. Bushnell to W. Rockefeller, Jan. 9, Apr. 9, 1894, Mar. 30, 1898; L. D. Clarke to W. Rockefeller, Nov. 28, 1899; E. B. Hough, for Bedford et Cie, to L. D. Clarke, May 14, 1895; Taylor, "History of the Standard Oil Co.," 275-276.

7. *U.S. Consular Reports,* No. 64 (June, 1886), 183; No. 151 (Apr., 1893), 582; No. 157 (Oct., 1893), 177; Riche et Roume, "L'industrie du pétrole aux États Unis d'Amérique," 83.

The difference in the tariff between kerosene and crude oil, which was 12 francs in the act of 1871, was reduced to 7 francs in 1873. The rates were 18 francs per 100 kilograms on crude and 25 francs on refined oil in 1881 and were continued to 1893.

8. Export Trade Recs., Libby to T. C. Bushnell, Apr. 10, May 22, 1893 (quotations in order).

9. *Ibid.*, Libby to T. C. Bushnell, Nov. 3, 1893.

10. *U.S. Consular Report,* No. 156 (Sept., 1893), 58.

The tariff law of June, 1893, provided for the application to petroleum of either a general or a minimum tariff. The duty under the general tariff continued at the rates set in January, 1892. Under the minimum tariff the rates were 9 and

12.50 francs per 100 kilograms for crude oil and refined respectively. The new law authorized the government to negotiate concessions; a commercial convention between France and Russia, reported July 12, reduced the rates to the minimum; a decree temporarily extended all the advantages given to Russia to imports from the United States.

11. Export Trade Recs., cable from Libby to New York, Nov. 8, 1893; Taylor, *op. cit.,* 310-312; W. L. Mellon, *Judge Mellon's Sons* (Privately printed, 1948), 139-182. See Chapter X, Note 28.

12. The cost of refining at Rouen was to include 10% depreciation on the plant and 5% for interest on capital. Both sides could cancel the agreement: the Refiners merely had to give six months' notice; Standard Oil could cancel only if imports of Russian illuminating oil exceeded 30% of the total annual French imports of crude and kerosene, or if competitors in France developed to such an extent that all their imports exceeded 20% of the total imports of these products from the United States.

13. Export Trade Recs., Libby to T. C. Bushnell, Feb. 20, 1894, to March 3, 1894, *passim;* cable to Libby, Mar. 6, 1894; Desmarais frères and Les Fils de A. Deutsch to Libby, Feb. 15, 1894; *Mineral Resources, 1899,* 21-26.

The exports of crude petroleum from the United States to Spain from 1894 to 1899 averaged 297,000 barrels per annum.

14. The committee which had represented the Refiners in making the contract served on "general business," such as claims, settlements and policy; another considered problems pertaining to the refineries of Bedford et Cie and commercial questions. The first was composed of Émile Deutsch, George Lesieur, and François Trystram; the second of Lesieur, Adolphe Beau, and Paul Paix.

15. Export Trade Recs., T. C. Bushnell to Libby, May 31, 1895 (quotation).

The normal transportation rates per barrel were written into the contract: Bradford to Philadelphia and New York 40 and 45 cents, respectively; lower country to these ports, 50 and 55 cents, respectively; local gathering charge 20 cents. The discount to be given if the price for crude petroleum f.o.b. New York or Philadelphia exceeded the quotation of the New York Produce Exchange for refined oil of 135° fire test was to be made in the form of a commission of 2 cents per barrel for each 5 points per gallon of the excess up to a maximum commission of 20 cents per barrel. Quotations for this grade of kerosene were irregular, and hence the quotation of export Standard White plus 15 points per gallon was to be taken as the price of 135° fire test.

Some of the small refineries imported kerosene in spite of the 3.5 francs differential per 100 kilograms in tariff rates.

16. Export Trade Recs., John J. Hoff to C. F. Ackermann, June 30, 1902 (quotations). The directors of Raffinerie Française were J. D. Archbold, F. E. Bliss, T. C. Bushnell, H. H. Rogers, and G. Southard. The managers were Marcel Delmas and Fernand Fourcade. The last-named was also given information for improving his refinery at Bilbao, Spain.

17. Export Trade Recs., Libby to Committee of French Refiners, Mar. 6, 1899; Libby to W. C. Teagle, Dec. 4, 1913 (quotations in order); *Mineral Resources, 1899,* 21-26.

18. Most of the material for this section comes from a study of SONJ, Consol. Accts. of S. O. Interests, 1892-1899, accounts of the various companies, 1892-1899; Export Trade Recs., 1892-1899, *passim;* and *Mineral Resources, 1899,* 21-26.

Interests of the Anglo-American Oil Co., Ltd., in the Continental affiliates were as follows in 1899: A. G. Atlantic, 60%; American Petroleum Co., 54.5%; Det Danske Petroleums-Aktieselskab, 30%; DAPG, 38%; Società Italo-Americana, 60%.

The directors of DAPG in 1895 were C. F. Ackermann, T. C. Bushnell, G. F. Gregory, W. H. Libby, James McGee, A. J. Pouch, Livingston Roe, and W. H. Tilford.

19. Archbold Recs., Libby to T. C. Bushnell, May 21, 1897; Socony P. P. Co. Recs., A. M. McGregor to G. H. Hopper, June 16, 1897; *U.S. Consular Report,* No. 200 (May, 1897), 114.

20. SONJ, balance sheets of Anglo-American Oil Co., Ltd., 1892-1899, and balance sheets of steamship companies, 1899; *Engineering*, LVII (Jan. 19, 1894), 72 ff.; *New York Times*, Mar. 31, 1896.

Barge No. 58, which was 250 feet long and carried 15,000 barrels of oil in 12 tanks, was equipped with special steam towing machinery and was used in the Atlantic trade.

21. SONJ, E. von Buren to L. D. Clarke, Mar. 23, 1896; Bachof, "DAPG," *passim*; *Oil, Paint & Drug Reporter*, XLVI, No. 4 (July 23, 1894), 7.

The DAPG started with five tankers in 1890. It ordered six more in that and the following year from Armstrong, Mitchell & Co. (*Standard*, *Brilliant*, *Diamant*, *Mannheim*, *Helgoland*, *Geëstemunde*) and acquired four more by 1891 by buying G. H. J. Siemers & Co. and August Sanders & Co. Of the older ships *Maybach* was lost and the *Hafir* sold. The veteran *Glückauf*, after being stranded on Fire Island, near New York, was sold for scrap in 1893. After 1892 five new tankers were added. DAPG's own shipbuilding engineer, C. J. Eckmann, a German trained in British shipyards, drafted plans for three new tankers (*Deutschland*, *Washington*, and *Excelsior*) and supervised their construction. The *August Korff* had been ordered by Petroleum-Raffinerie vorm. August Korff and came to DAPG with that corporation; it was used chiefly for carrying crude to Nordenham. The *Helios*, bought in 1896 from the American Cotton Oil Co., was useful because it was equipped with heating coils. Between the years 1892 and 1896 the Shipping Department and the work of provisioning and repairing vessels was moved from Geëstemunde to Hamburg.

22. Redwood, *Petroleum*, 520.

23. SONJ, accounts of various companies, 1892-1899, *passim*, especially Annual Report of Anglo-American Oil Co., Ltd., 1896, and memorandum, "Total Deliveries of Anglo-American Oil Co., Ltd., 1889 to 1896" (by barrels and tank wagons); Anglo-American Oil Co., Ltd., stable equipment for itself and subsidiaries; Consol. Accts. of S. O. Interests, 1895; DAPG, excerpt from Directors' Report, 1894; Export Trade Recs., W. Randebrock to L. Roe, June 2, 1899; extract from Minutes of Königsberger Handels-Compagnie; Bachof, *op. cit.*, *passim*; *Det Danske Petroleums-Aktieselskab, 1889-1939* (Copenhagen, n.d.), 27; *U.S. Consular Report*, No. 178 (July, 1895), 506-507; *Ind. Comm.*, I, 533.

24. SONJ, copies of agreements of Det Danske Petroleums-Aktieselskab with Svenska 1892, Ostlandske in 1892, Vestkustens in 1895, Skanska in 1896, Krooks in 1896, and Sydsvenska in 1899.

25. This and the following paragraph have depended on Export Trade Recs., W. Randebrock to L. Roe, Sept., 9, 1892, to June 2, 1899, *passim*; F. Speth to L. Roe, Nov. 18, 1892, Aug. 20, 1894.

26. Export Trade Recs., W. F. Randebrock to L. Roe, Sept. 9, 1892 (quotation); *Engineering* (London), LVI (Nov. 3, 1893), 548.

Randebrock estimated that American Petroleum would need 8,000 tanks for retailers in Holland alone.

In kilograms, per capita annual consumption estimates in Europe ranged from 5 for Russia and 10 in Sweden to 26 in Holland and 38.5 in Belgium. The estimate for the United States was 75 kilograms in *Engineering*.

27. SONJ, records of the various companies, 1892-1899, *passim*; C. T. Bowring & Co. to W. L. Mellon, chairman, The Bear Creek Refining Co., Ltd., Oct. 26, 1895; The Bristol & West of England & South Wales Petroleum & Storage Association, Ltd., memorandum of association and amendments; Bachof, *op. cit.*, *passim*.

In the early 1890's there was intense competition in the west of England and southern Wales between stations of the Anglo-American Oil Co., The Bear Creek Oil & Shipping Co., Ltd. (29% owned by The Bear Creek Refining Co., Ltd., Philadelphia) and The Bristol & West of England & South Wales Petroleum & Storage Association, Ltd., a marketing company organized by merchants of Bristol, Exeter, Cardiff, Gloucester, and Somerset. Anglo-American acquired the Storage Association and the Mellons' share in Bear Creek Oil & Shipping. C.

T. Bowring & Co. continued to manage the latter company.

28. SONJ, accounts of various companies, *passim*; copy of contract of Det Danske Petroleums-Aktieselskab with Krooks Petroleum & Oljeaktiebolag, June 18, 1896; Export Trade Recs., Libby to T. C. Bushnell, Aug. 23, Sept. 1, 1893; F. Speth to L. Lambert, Sept. 23, 1893; Libby to Jules Aaron, Sept. 25, 1893; copy of contract of DAPG and American Petroleum Co., Apr. 23, 1897; F. Speth to L. Roe, Oct. 7, Dec. 9, 27, 1898, Apr. 17, 1900; copy of agreement of American Petroleum Co. and Société Belgo-Hollandaise des Pétroles, Jan. 9, 1899; T. C. Bushnell to W. Rockefeller, Jan. 7, 1899; F. Schütte to S. O. Co., Mar. 18, 1901; *Ind. Comm.*, I, 566; e.g., *New York Journal*, May 22, July 20, 21, 1896; *Toledo Blade*, Nov. 28, 1898.

Nobels made some sales directly to railroads and public institutions in the area of the American Petroleum and Rieth & Co.; these were included in the quota, and the American Petroleum Co. guaranteed to market the difference. DAPG bought Rieth's plants in Germany and took over his contracts with Baku Standard for leases at Düsseldorf and Frankfurt am Main.

When Archbold testified before the Industrial Commission that Standard Oil had no "relationship or understanding" with Nobels, he was stating the legal truth. Standard Oil had no such relationship; its affiliates did.

29. SONJ, Salary Bk. B; *New York Tribune*, Mar. 28, May 15, 1896 (Dodd); *New York Journal*, May 18, 1897, Mar. 16, 1899; New York *World*, May 14, 1896, July 4, 1897; *New York Journal of Commerce and Commercial Bulletin*, July 29, 1896; *Oil, Paint & Drug Reporter*, L, No. 9 (Aug. 31, 1896), 26 ff.; LIV, No. 4 (July 25, 1898), 5; *Ind. Comm.*, I, 532, 735; P. Dvorkovitz, "The Eight-Cornered Table and Its Sequel," *The Petroleum Review*, XV, No. 383 (Oct. 13, 1906), 205-206; *Mineral Resources, 1898*, 155; *Mineral Resources, 1899*, 21-25.

30. SONJ, excerpt from DAPG directors' report for 1894; Export Trade Recs., F. W. Randebrock to L. Roe, Oct. 2, 1891, Aug. 28, 1896; Pamphlet, "Kosmodike," März, 1898, 37-42; *U.S.* v. *SONJ*, XVII, 3630, 3647; *Ind. Comm.*, I, 273-274, 381, 616-617, 624-626; Taylor, *op. cit.*, 283; Nevins, *Rockefeller*, II, 24; Tarbell, *Standard Oil*, II, 175-177.

When organized in Sept., 1896, Mannheim-Bremer Petroleum-Aktiengesellschaft included Goepel & Trube (oil brokers of New York), Rassow, Jung & Co. of Bremen, and Philip Poth's firm, which had important tankage at cities on the Elbe and Rhine.

31. *U.S. Consular Report*, No. 198 (Mar., 1897), 330; *Mineral Resources, 1899*, 21-25.

Exports of Kerosene to Europe from the United States, 1892 and 1899
In thousands of barrels

	United Kingdom	Belgium	Netherlands	Germany	Scandinavia	Italy
1892	2,260	749	1,824	3,177	433	532
1899	4,257	969	3,290	2,741	831	470

Because of the trade up the Rhine, the imports to the Netherlands and Germany must be considered together. No export figures are available for Standard Oil alone, but it accounted for a large part of the total shipments. The imports for the years in between show considerable fluctuations.

32. Data on Canada and The Imperial Oil Co., Limited, were furnished by John S. Ewing.

The British Columbia Oil Co., Ltd., had a capital of $10,000.

33. Rockefeller Recs., O. H. Payne to Rockefeller, Mar. 10, 1884; *Paint, Oil & Drug Review*, XXV, No. 5 (Dec. 22, 1897), 19.

Samuel Rogers was interested in the Queen City Oil Works of Toronto, Hamilton Oil Co. in Hamilton, Rogers & Morris, Ltd., in Ottawa, and Rogers, Robertson & Co. in Montreal.

34. Other small refineries added to the Bushnell interests were: The National Refining Co., John McMillan Refinery, Consumers' Oil Co., Petrolia Oil Co., all in Petrolia, and the Empire Oil Works of London, Ontario.

35. Cleveland *Leader,* July 4, 1898; *Ind. Comm.,* I, 573.

The Petrolia Crude Oil & Tanking Co. and the Minhinnick Refinery were acquired at the same time.

36. SONJ, Minutes of The West India Oil Refining Co., 1892 to 1899, *passim*; Archbold Recs., W. H. Van Syckel, administrator of The West India Oil Refining Co., to F. Q. Barstow, Dec. 16, 1898; C. F. Lufkin to J. D. Archbold, Feb. 24, 1899; *Oil, Paint & Drug Reporter,* 1892-1899, *passim*; New York *World,* Mar. 20, 1898; *New York Herald,* Mar. 26, Apr. 2, 1898; New York *Sun,* May 19, 1898.

37. SONJ, morgued Corp. Recs.; Taylor, *op. cit.,* 296; *Mineral Resources, 1899,* 25; *New York Journal,* May 16, 1896; *Paint, Oil & Drug Review,* XXII, No. 5 (July 29, 1896), 16; *Oil, Paint & Drug Reporter,* LIII, No. 19 (May 9, 1898), 8.

38. Archbold Recs., Libby to T. C. Bushnell, May 21, 1897; *U.S. Consular Reports,* No. 145 (Oct., 1892), 282-289.

The per capita consumption of kerosene in India was less than a quarter of a gallon per annum.

39. *U.S. Consular Reports,* No. 162 (Mar., 1894), 458-459; No. 171 (Dec., 1894), 557.

40. C. Gerretson, *Geschiedenis der 'Koninklijke,'* 2 vols. (Haarlem, 1932, 1936), I, 297-303, II, 208 ff.; Henry, *Thirty-Five Years of Oil Transport,* 33-34, 41-57; *U.S. Consular Reports,* No. 146 (Nov., 1892), 456-458; No. 151 (Apr., 1893), 579-580; No. 165 (June, 1894), 169-170; *The Journal of the Society of the Chemical Industry,* XIII, No. 11 (Nov. 30, 1894), 1117.

41. Archbold Recs., C. F. Lufkin to Archbold, July 9, 1897 (quotations); John Fertig to Archbold, Mar. 17, 1898, to May 1, 1899, and newspaper clippings enclosed, *passim*; *U.S. Consular Reports,* No. 212 (May, 1898), 51-52; No. 226 (July, 1899), 407; No. 228 (Sept., 1899), 90-91.

42. Archbold Recs., J. E. Ernst to Libby, Sept. 11, 1899.

43. *Ibid.,* Lufkin to Archbold, May 18, 1897 (quotation), July 5, 1897; Fertig to Archbold, July 5, 1897; *Mineral Resources, 1897,* 152.

44. SONJ, Salary Bk. C; *N. Y. Journal of Commerce & Commercial Bulletin,* Sept. 17, 1897.

In 1896 some 13,800,000 cases of kerosene were shipped to the Far East from the United States in 200 vessels, most of them sailing ships.

45. *Mineral Resources, 1894,* 323.

46. Archbold Recs., Libby to T. C. Bushnell, May 21, 1897; C. F. Ackermann to Archbold, June 28, 1899; L. Roe to Archbold, Nov. 27, 1899, enclosing report on Szechwan of subagent H. T. Hancock, July 21, 1899; Fertig to Archbold, Oct. 13, 1899; *U.S. Consular Report,* No. 188 (May, 1896), 140.

Although it took an expensive journey of 2½ to 3½ months to send oil from Shanghai via Hankow to Chungking, a profitable subagency was opened there to serve an estimated population of 60,000,000. Fertig, a production expert, prophesied that "no material development of the Petroleum resources of China can be expected for some time."

47. Archbold Recs., J. H. Fertig to Archbold, Jan. 12, July 24, 1898.

48. *Ibid.,* 1897-1899, *passim*; Gerretson, *op. cit.,* I, 362-367.

Standard Oil's team of specialists who made studies of production in various areas included C. F. Lufkin, J. H. Fertig, John Worthington, J. F. Eckbert, and F. H. Oliphant. The last-named worked for the United States Geological Survey, but for Standard Oil was on a retainer basis.

49. Archbold Recs., Lufkin and Fertig to Archbold, Feb. 3, 1897.

Unless otherwise mentioned, the data for the following pages came from Archbold Recs., Lufkin to Archbold, 1897, *passim*; Fertig to Archbold, 1897-1899, *passim,* and enclosed translations from Dutch newspapers, and Ackermann to Archbold, 1898-1899, *passim.*

50. Archbold Recs., Lufkin to Archbold, Apr. 19, 27, 1897; Fertig to C. F. Ackermann, Nov. 12, 1898 (quotations in order).

51. *Ibid.,* Fertig to Archbold, Apr. 20, 1897.

52. *Ibid.*, Lufkin and Fertig to Libby, Apr. 24, 1897 (quotation); Lufkin to Archbold, Apr. 19, 1897; Fertig to Archbold, Apr. 20, May 30, 1897.

53. *Ibid.*, Libby to T. C. Bushnell, May 21, 1897; memo of F. Q. Barstow, June 16, 1897.

54. Gerretson, *op. cit.*, I, 396-402.

55. Archbold Recs., Fertig to Archbold, Aug. 2, 1897.

56. *Ibid.*, Fertig to Archbold, Feb. 28, 1898 (quotation); Gerretson, *op. cit.*, II, 80-103, 242.

57. Archbold Recs., Fertig to Archbold, Nov. 4, 1899; Gerretson, *op. cit.*, II, 61-63, 111-114.

58. Archbold Recs., Fertig to Archbold, Sept. 12 (quotation), 13, 1898.

59. SONJ, Consol. Accts. of S. O. Interests, 1892-1899; *Mineral Resources, 1899*, 22-26.

CHAPTER 10

1. *Ind. Comm.*, I, 261, 589, and 598; *U.S.* v. *SONJ*, I, 464-468, 475, and III, 1431 (Testimony of W. W. Tarbell); *Oil, Paint & Drug Reporter*, LI, No. 9 (Mar. 1, 1897), 25.

The Pure Oil Company, Ltd., was organized in New Jersey, 1895, with a capital of $1,000,000, raised by 1898 to $10,000,000. The associated interests were: the Producers' Oil Co., Ltd., organized in 1891 with a capital of $600,000; the Producers' & Refiners' Oil Co., Ltd., organized in 1892 with a capital of $250,000; the United States Pipe Line Co., first capitalized at $600,000 in 1892, later at $2,000,000. These companies operated gathering and local pipelines in Pennsylvania and two trunk lines of the United States Pipe Line Co., which carried crude and kerosene near to the coast and then over the New Jersey Central Railroad. Through stockholders there were associated with this group many producing interests and some seventeen refineries, the two largest of which were owned by the Emery Manufacturing Company, Bradford, Pa., and The Columbia Oil Co., Bayonne, New Jersey.

2. Rockefeller Recs., telegram, Rockefeller to Archbold, Aug. 28, 1892.

3. SONJ, morgued Corp. Recs.; Producers' Consolidated Land & Petroleum Co., Letter Book, Seep to D. O'Day, Oct. 29, 1895; Seep to C. M. Baker, Nov. 19, 1895; Taylor, "History of the Standard Oil Co.," 157-158, 334-335, 342, 344, 346.

Stocks in some other small producing companies were acquired during the nineties. South Penn Oil Co. held 50% of The New Domain Oil & Gas Co., incorporated Sept. 8, 1892, and operating in Kentucky and West Virginia. In 1898 the National Transit Co. bought 35.9% interest in the Hazelwood Oil Company, which had been incorporated in Pennsylvania in May, 1873.

4. The Carter Oil Co., Minute Bk., Apr. 24, 1893, May 20, 1893, including letter of John J. Carter to Board of Directors, May 20, 1893.

5. Crum and Dungan, *Romance of American Petroleum and Gas*, I, 264-266, and II, 122; McLaurin, *Sketches in Crude Oil*, 127, 222; Derrick's *Handbook*, I, 856-857; *Oil City Derrick*, Feb. 11, 1897; *Paint, Oil & Drug Review*, XXI, No. 21 (May 20, 1896), 20; personal interviews with men who knew Carter and appreciated his qualities.

6. The Carter Oil Co., Minute Bk., 1895-1899, *passim*; SONJ, Salary Bks. B and C; James L. Darnell and Arthur Eaton, "The Carter Oil Co., Eastern Division Valuation Report, Producing Properties, 1913-1919," 25 volumes, *passim*; *Mineral Resources, 1897*, 23.

The early directors of The Carter Oil Co. were Joseph Seep, C. N. Payne, N. F. Clark, and George A. Eckbert. John F. Eckbert was the superintendent at Sistersville. By 1897 there was a total of 35 salaried employees, including 15 farm bosses.

7. *Oil, Paint & Drug Reporter*, 1895-1899, *passim*, especially LI, No. 21 (May 24, 1897), 7; LII, No. 19 (Nov. 8, 1897), 6, and No. 20 (Nov. 15, 1897), 5 (quotation); *Oil City Derrick*, Nov. 20, 1896, Nov. 1, 1897; *Pittsburgh Commercial Gazette*, May 1, June 3, 1897.

8. Rockefeller Recs., Archbold to Rockefeller, Aug. 25, 1892; Henry Lewis to Rockefeller, Dec. 8, 1892.

9. *Oil, Paint & Drug Reporter,* XLVIII, No. 10 (Sept. 2, 1895), 7; *Mineral Resources, 1896,* 769, 835-836; *1897,* 26.

10. Isaiah Bowman, "History of Drilling and Deep Well Records," *The Petroleum Review,* XXV, No. 514 (Oct. 21, 1911), 275-276; *Paint, Oil & Drug Review,* XXIII, No. 6 (Feb. 10, 1897), 16; *Pittsburgh Commercial Gazette,* June 20, 1897; Whiteshot, *The Oil-Well Driller,* 96; *Mineral Resources, 1896,* 765.

11. C. C. Rister, *Oil! Titan of the Southwest* (Norman, Okla., 1949), 31-34; *Neodesha Register,* June 12, 1896; Independence *Reporter,* Apr. 7, 1896; Archbold Recs., *passim.*

C. F. Lufkin, J. F. Eckbert, and J. H. Oliphant also reported on Wyoming, Colorado, Indian Territory, and California in the 1890's.

12. SONJ, Salary Bk. C; *Ind. Comm.,* I, 360; *Neodesha Register,* Feb. 21, Mar. 6, Apr. 3, May 8, 18, June 12, Dec. 11, 1896; Independence *Reporter,* Feb. 26, 1896 (Fertig's letter to press); *Wilson County Sun,* Neodesha, Feb. 14, 28, 1896, Mar. 26, 1897 (interview with O. A. Evans, who at the end of 1896 succeeded J. H. Fertig when he went to the Dutch East Indies); *Mineral Resources, 1896,* 847.

13. *Wilson County Sun,* Feb. 14, 1896; *Star & Kansan,* Apr. 9, 1897; *Neodesha Register,* May 1, June 12, 1896; Independence *Reporter,* Feb. 23, 1896.

14. SONJ, Consol. Accts. of SONJ, 1899; *U.S.* v. *SONJ,* I, 289 ff. and 317-321, VII, 120-123, Petitioner's Exhibit 35; *National Petroleum News,* May, 1913, 23-24 (affidavit by J. S. Cullinan). Cullinan was later head of The Texas Co.

15. Rister, *op. cit.,* 44; *Mineral Resources, 1889-1890,* 359-361; *1896,* 848; *1897,* 102-104; *Oil, Paint & Drug Reporter,* 1897-1898, *passim*; *Oil City Derrick,* Jan. 16, Mar. 29, Apr. 30, 1898; New York *Sun,* Aug. 8, 1899; *Pittsburgh Commercial Gazette,* Sept. 18, 1899.

16. *The Ohio Oil Company 60th Anniversary, 1887-1947,* 15-18; *Ohio State Journal, passim,* especially June 18, 24, 1896; *Toledo Blade,* May 6, 1896, Aug. 19, 1899; *Pittsburgh Commercial Gazette,* Oct. 30, 1899; *Paint, Oil & Drug Review,* 1892-1899, *passim.*

17. SONJ, cases over leases; *Oil, Paint & Drug Reporter,* XXIV, No. 1 (July 7, 1897), 16, and No. 26 (Dec. 29, 1897), 17.

18. *Paint, Oil & Drug Review,* 1892-1899, *passim*; *Oil, Paint & Drug Reporter,* 1892-1899, *passim*; *Pittsburgh Leader,* Feb. 16, May 3, 1896; *Oil City Derrick,* Jan. 6, Feb. 20, Mar. 26, 1896, Feb. 11, 1897, Mar. 16, 1898, Aug. 2, 1899; *Ind. Comm.,* I, 360-372.

The cost of drilling differed greatly both because of the difference in depths of wells and in geological formations. In 1898 The Ohio Oil Company was paying contractors 40 cents per foot for drilling. The *Derrick* gave Jim Wade credit for being the first to use a gas engine to pump wells. Batch pumping with one powerful engine was quite common by the close of the century.

19. SONJ, collection of predissolution data; *Ind. Comm.,* I, 140.

20. Rockefeller Recs., Rockefeller to Archbold, Aug. 16, 1897.

21. *Ibid.,* W. Rockefeller to J. D. Rockefeller, Aug. 21, 1890.

22. *Ind. Comm.,* I, 436; *Mineral Resources, 1895,* 648 (quotation); *1899,* 63, 66, 68, 69.

23. SONJ, Salary Bks. B and C; John Bushnell to Robt. S. Hampton, July 15, 1898; *U.S.* v. *SONJ,* II, 646-650, 653-656; III, 1426-1428; XVII, 3235.

In 1897 Seep and his employees were transferred from the salary record of "John Bushnell, Comptroller" to a separate account under Seep's name. The next year "banking functions" were removed from his agency. The gathering pipage was always paid by the Crude Oil Purchasing Dept., which also paid trunk pipage in most districts. In some cities, i.e., Philadelphia, Pittsburgh, and Baltimore, the consignee refinery paid the trunk line charges directly to the pipeline.

24. *Toledo Blade,* Oct. 2, 1896; *Pittsburgh Post,* Jan. 1, 16, 1896; *Pittsburgh Leader,* Jan. 26, 1896, Sept. 25, 1898; *Titusville Herald,* Jan. 6, Feb. 3, 1896; *Paint, Oil & Drug Review,* XXI, No. 4 (Jan. 22,

1896), 16; XXVI, No. 19 (Nov. 9, 1898), 16; *Pet. Ind.*, 13.

Some oil certificates were sold on the exchange at lower prices than were paid for credit balances. This was not for "cash oil" but for futures.

25. *Paint, Oil & Drug Review*, XXI, No. 1 (Jan. 1, 1896), 12 (quotation); *Ind. Comm.*, I, 285 and 572.

26. *Pittsburgh Leader*, Jan. 26, 1896; New York *Sun*, Mar. 21, 1897; *Oil, Paint & Drug Reporter*, 1896, *passim*.

27. *U.S.* v. *SONJ*, XIX, 621; letters to and from Mortimer F. Elliott (hereinafter cited as Elliott Recs.), M. F. Elliott to J. O. Troup, Apr. 20, 1898.

28. Rockefeller Recs., Archbold to Rockefeller, Nov. 2, 1891, July 1, 1892, Aug. 3, 7, 1893; Elliott Recs., Elliott to H. M. McSweeney, Mar. 30, 1900; *U.S.* v. *SONJ*, I, 375-376; XVII, 3232-3233; Taylor, *op. cit.*, 310-312; *Ind. Comm.*, I, 293; *Oil, Paint & Drug Reporter*, XLII, No. 20 (Nov. 14, 1892), 9; XLVIII, No. 22 (Nov. 25, 1895), 6; W. L. Mellon, *Judge Mellon's Sons* (privately printed, 1948), 139-182.

Between 1883 and 1895 there was a Pennsylvania law prohibiting the consolidation of pipelines. The repeal bill was vetoed in 1893 but passed in 1895. Since it was a legislative measure favorable to the combination, it would be interesting to know how the goal was achieved.

The contract between the Mellons and Rogers stipulated that there should be a cash payment of $225,000 and that the stocks were to remain the property of the Mellons until out of the dividends they should have received another $641,889.96 on the stock, with 6% interest on the deferred payments. In the meantime, the certificates assigned in blank were deposited with the Central Trust Co. The cash needed was advanced by the Standard Oil Co. of New York.

29. *John J. Carter* v. *The Producers' Oil Company, Limited*; *Oil City Derrick*, Dec. 16, 1896; *Pittsburgh Leader*, Apr. 22, 1896; *Pittsburgh Commercial Gazette*, Apr. 23, Aug. 4, 1896, Feb. 4, 22, 1897.

Carter as an original stockholder was allowed to vote his 300 shares but not those acquired later. He held about 30,000 out of 60,000. J. C. McDowell voted the National Transit Co.'s shares in the United States Pipe Line.

30. See above, Table 5.

31. SONJ, Salary Bks. A, B, and C.

32. SONJ, morgued leases and contracts, agreement between International Oil Works, Ltd., and James McGee, Mar. 18, 1895; Consol. Accts. of S. O. Interests, 1895-1899; Taylor, *op. cit.*, 310-315, 324-326, 329-330; *Ind. Comm.*, I, 272, 370.

33. SONJ, Consol. Accts. of S. O. Interests, 1892-1899, classified earnings.

34. SONJ, Consol. Accts. of S. O. Interests, 1897-1899.

35. SONJ, Consol. Accts. of S. O. Interests, general analysis of business of manufacturing interests, 1897.

36. SONJ, Lepley Recs., B. H. Lepley to C. O. Meyer, Oct. 2, 1923; Consol. Accts. of S. O. Interests, general analysis of business of manufacturing interests, 1896; *Paint, Oil & Drug Review*, XXVI, No. 22 (Nov. 30, 1898), 22 (quotation).

37. SONJ, Lepley Recs., Lepley to Meyer, Oct. 2, 1923; Consol. Accts. of S. O. Interests, analyses of business of Indiana Standard, Ohio Standard, Solar Refining, New York Standard, Atlantic Refining, and Jersey Standard, 1892-1899; *Oil, Paint & Drug Reporter*, 1894-1895, *passim*; *Cleveland Leader*, Dec. 30, 1896.

38. SONJ, Bayonne Cost & Yield Statements, 1892-1899; Lepley Recs., Lepley to Meyer, Oct. 2, 1923; Consol. Accts. of S. O. Interests, analyses of business, Bayonne Refinery, 1893 and 1899.

Bayonne's deliveries of kerosene to domestic trade in 1899 consisted of 46,032,316 gallons of Water White and 6,231,622 of Standard White for a total of 52,263,938 gallons (1,244,379 barrels), while its deliveries for export trade consisted of 11,943,925 gallons of Water White, 123,349,839 of Standard White, and 14,128,385 in cases, for a total 149,422,149 gallons (3,557,670 barrels).

39. SONJ, Lepley Recs., Lepley to Meyer, Oct. 2, 1923; Salary Bk. C.

40. SONJ, Bayonne Appropriation Bk. and cards, 1892-1899; Bergenport Chemical Works, appropriation cards, 1892-1899; Record of Sealed Instruments,

agreement with Pratt Process Co., June 22, 1898; *Ind. Comm.*, I, 358; *Paint, Oil & Drug Review*, XXVII, No. 9 (Mar. 1, 1899), 16.

41. SONJ, Bayonne Appropriation Bk. and cards; Boverton Redwood, "Petroleum Industry," in C. E. Groves and W. Thorp, eds., *Chemical Technology*, 2 vols. (Philadelphia, 1895), II, 211; *New York Times*, Mar. 18, 1898; *Philadelphia Record*, Jan. 31, 1898.

42. Lepley Recs., G. P. France to B. H. Lepley, Mar. 26, 1897.

43. SONJ, large brown-paper-bound packages of petitions from inventors and replies; *U.S.* v. *SONJ*, XVI, 2650.

44. *Ind. Comm.*, I, 372 (quotation), 628.

45. SONJ, Consol. Accts. of S. O. Interests, 1893 and 1897; Baltimore Refinery, "Information compiled for the Board of Directors Standard Oil Company of New Jersey upon the occasion of their Inspection Visit, Wednesday, December 6, 1944." In the wax category, the Baltimore plant produced only roofers' wax and paraffin distillate prior to 1906.

46. SONJ, Consol. Accts. of S. O. Interests, 1890 and 1897, general analysis of business of manufacturing interests; *Ind. Comm.*, I, 570. Archbold said the value of Standard Oil by-products equaled "substantially" the value of kerosene in 1899.

47. *Salesmotor*, II, No. 4 (Apr., 1921), 27.

Unless otherwise stated, the material in this section comes from a study of SONJ, Consol. Accts. of S. O. Interests, 1892-1899, and accounting papers of the various marketing companies, 1892-1899; Salary Bks. B and C and Real Estate Register; *Record of Pleadings and Testimony in Standard Oil Trust quo warranto cases, in the Supreme Court of Ohio* [(Columbus, Ohio), 1899] (hereinafter cited *Standard Oil Trust Cases, Ohio, 1899*), 551, 648, 695; *U.S.* v. *SONJ*, XVI, 2626-2629, and XVII, 3242-3244, 3464, 3467-3469, 3483, 3489; *Waters-Pierce Oil Co.* v. *Texas* (1907), 694-701, 709, 825-832, 879; *Missouri* v. *S. O. Co. (Ind.), Waters-Pierce Oil Co., and Republic Oil Co.* (1907), Testimony, *passim*, especially 2009-2010, 2409-2415, 2456; *Missouri* v. *Johnson*, 181-255, Testimony.

48. "The Oil Business in Baltimore," *Salesmotor*, II, No. 4 (Apr., 1921), 23; IX, Nos. 3 and 4 (Mar.-Apr., 1928), 29.

49. SONJ, agreement between SONJ and Nicolai Brothers, July 31, 1899. The brothers leased their real estate and went on the Standard payroll.

50. *Ind. Comm.*, I, 343-344 (sample of inspector's questions).

51. See Chapter 12.

52. *Ind. Comm.*, I, 779; *Paint, Oil & Drug Review*, XXI, No. 5 (Apr. 8, 1896), 16; XXIII, No. 12 (Mar. 24, 1897), 16; *Engineering & Mining Journal*, LV, No. 6 (Feb. 11, 1893), 132; LXII, No. 10 (Sept. 5, 1896), 220; LXIII, No. 11 (Mar. 13, 1897), 253.

The *Maverick*, a screw steamship with steel hull built in 1892 at Columbia Iron Works, Baltimore, burned in Halifax Harbor in 1899. By 1897 Standard had a tanker on the Great Lakes with a capacity of 22,500 barrels; launched at Buffalo, it was reported the largest vessel of its kind built on inland waters.

Competitors marketing in California used combination tank cars, too. One firm won a suit which Standard Oil had brought in an attempt to enjoin it for violating a patent; the competitor's tank car had places for dry freight on each side of a tank.

53. *Ind. Comm.*, I, 549-552; *Standard Oil Trust Cases, Ohio, 1899*, 551 and 695; *Missouri* v. *Johnson*, 181 and 255, Testimony; *Waters-Pierce Oil Co.* v. *Texas*, 1907, Testimony, 699-701, 827-832.

In some areas it appeared advisable to continue relations with a jobbing customer of long standing. He received a discount on purchases but relieved a marketing company of working the territory, soliciting the orders, and carrying the credit. A halfway arrangement was made in some instances; sales to retailers were made by an employee of Standard Oil, working either on salary or on commission, who supplied his own equipment and his own storage tanks, or at least his own tank wagon.

54. *Standard Oil Trust Cases, Ohio, 1899*, 548-550, 700-703 (description of a bulk station, Columbus, Ohio).

To clean returned barrels live steam was thrown through a "steaming apparatus" which served four barrels at a time. After the steaming, the barrels were taken to the cooper shop where the hoops were redriven, broken heads and staves repaired, and the barrels reglued and filled.

55. G. G. Rossiter, "Experiences of Retiring Cashier Recalled," *Salesmotor*, XI, No. 10 (October, 1930), 63.

56. Socony Recs., annual report on business by all companies in Standard Oil interests, 1906, 68.

In 1896 about 85% of the deliveries in Michigan were by tank wagon. Ten years later in Texas the ratio of "can wagons" to tank wagons was about 1 to 2. In some areas it took some time to settle the question whether the oil inspector had to sample the oil in each tank-wagon load.

57. *Pittsburgh Leader*, Feb. 23, 1896.

58. *Pittsburgh Commercial Gazette*, May 18, 1896; *Paint, Oil & Drug Review*, 1896-1898, *passim*; *Oil, Paint & Drug Reporter*, LIII, No. 24 (June 13, 1898), 9; "Giants Wrestle, Two Illuminating Oil Companies Hotly Contesting Ground," *Cleveland Leader*, Mar. 29, 1897.

59. *Ind. Comm.*, I, 366-367.

60. *Ibid.*, I, 265-277, 366, 505, 528-529, 568-569, 572-573, and 629.

61. *Scientific American*, LXIX (Aug. 26, 1893), 131 (quotation), and (Sept. 9, 1893), 163.

62. "The Naphtha Launch, The Most Popular Pleasure Boat Ever Built," *Seaboard* (Apr. 30, 1891), 3.

63. SONJ, Salary Bks. B and C; Williams Recs., T. J. Williams to C. M. Pratt, Feb. 7, 1899; *U.S.* v. *SONJ*, XVII, 3535-3538; *Paint, Oil & Drug Review*, XXIV, No. 7 (Aug. 18, 1897), 16; "Who's Who in the Marketing Department," *The Lamp*, I, No. 3 (Sept., 1918), 25; "The New Neighborhood Stores," *The Lamp*, X, No. 2 (Aug., 1927), 13; T. J. Williams, "Creating a Market for Stove Gasoline," *Salesmotor*, II, Nos. 7 and 8 (July-Aug., 1921), 5-6.

64. Advertisements, *Oil, Paint & Drug Reporter*, 1888-1899, *passim*.

65. SONJ, letters from T. J. Williams (hereinafter cited as Williams Recs.), T. J. Williams to C. M. Pratt, Feb. 7, 1899; *Pittsburgh Commercial Gazette*, May 31, 1898.

66. H. Tweddle, "Crude Petroleum and Its Products as Fuel," *Engineering & Mining Journal*, LXVIII (Oct. 14, 1899), 459 ff.; *Cleveland Leader*, Aug. 26, 1897; *New York Herald*, Oct. 4, 1896; *New York Times*, Aug. 4, 1897; *Oil, Paint & Drug Reporter*, 1892-1899, *passim*. Eastern railroads did use heavy oil to expedite ignition of fires and to lay dust on roadbeds.

67. Rockefeller Recs., Charles F. Foster, mechanical engineer of works, to D. H. Burnham, director of works, World's Columbian Exposition, Nov. 22, 1893; SONJ, S. O. Co., Chicago, Ill., fuel oil acct., 1895; "Oil Fuel and Boilers at the Great Exposition," *Scientific American*, LXII, No. 2 (July 8, 1893), 17 and 22; *Oil, Paint & Drug Reporter*, XLI, No. 12 (Mar. 21, 1892), 9; *New York Tribune*, Feb. 16, 1897; *Paint, Oil & Drug Review*, XXIV, No. 3 (July 21, 1897), 17, and No. 4 (July 28, 1897), 10-11; XXVI, No. 16 (Oct. 19, 1898), 17.

68. E.g., *Oil, Paint & Drug Reporter*, 1893-1899, *passim*; *New York Times*, Oct. 10, 1897; *Oil City Derrick*, Feb. 3, 4, 1898; *Paint, Oil & Drug Review*, XXV, No. 10 (Mar. 9, 1898), 22.

69. SONJ, balance sheets, Gilbert & Barker Mfg. Co., 1895; Philadelphia *Press*, July 19, 1897; *Oil City Derrick*, Aug. 23, 1897.

70. Williams Recs., T. J. Williams to O. N. Cammann, vice-president of Chesebrough Mfg. Co., Dec. 1, 1899; *Paint, Oil & Drug Review*, XXIV, No. 4 (July 28, 1897), 10-11 (quotation on 11).

71. *Ind. Comm.*, I, 560; *U.S.* v. *SONJ*, XIX, 688-692; SONJ, collection of predissolution data.

CHAPTER 11

1. *New York Tribune*, Feb. 1, 1896; *New York Journal*, May 12, 1897.

2. *Star & Kansan,* Nov. 26, 1897.

3. *Pittsburgh Leader,* Mar. 18, 1896.

4. New York *World,* May 1, 1897; *New York Herald,* May 13, 1897.

5. See Chapter 22.

6. *U.S.* v. *E. C. Knight Co.,* 156 U. S. 1. (Italics by authors.)

7. *Ind. Comm.,* I, 1077-1087; Eliot Jones, *The Trust Problems in the United States* (New York, 1927), 30; E. von Halle, *Trusts or Industrial Combinations and Coalitions in the United States* (New York, 1896), 95-97.

8. Von Halle, *op. cit.,* 97.

9. Nevins, *Rockefeller,* II, 357.

10. Dodd, *Memoirs,* 30-31.

11. *Loc. cit.*

12. Calculated from SONJ, "Statement from Stock Books of Standard Oil Company of New York, showing all stockholders of record between the dates indicated, and the amount of their holdings on the respective dates."

13. SONJ, Minute Bk.

14. SONJ, Common Stock Ledger and Preferred Stock Ledger; *U.S.* v. *SONJ,* XIX, Defendant's Exhibit No. 388, opposite 894; Elliott Recs., M. F. Elliott to J. C. McDowell, June 19, 1899; Elliott to V. P. Kline, June 4, 1907; H. C. Folger to Elliott, July 19, 1911, and various telegrams; Dodd Recs., Dodd to Rice, Jan. 5, 27, 1904; *Ind. Comm.,* I, 575.

On June 24, 1899, Rice was sent a circular letter, in the name of the liquidating trustees, requesting that his Trust certificates should be turned in and warning him that dividends on the certificates would be terminated. Another circular letter was sent out on September 18, 1899. By 1904 only Rice and a man named Martin still held Trust certificates. Rice died in February, 1905, and his daughter had difficulty in settling the estate, claimants being numerous. Ironically, the chief items of value in the estate were 7 shares in the Standard Oil Trust and fractional shares in the twenty companies, which equaled another Trust share. After other claimants had agreed that the daughter, Mrs. Butts, was entitled to the proceeds of the Standard Oil holdings, she turned for assistance to Rice's old friend, Frank S. Monnett, then practicing law in Columbus, Ohio. He opened a correspondence with Elliott, with the result that Jersey Standard purchased the Trust certificates and fractional shares for an undisclosed sum. Market value and dividends since March 15, 1900, were considered in arriving at price.

Inasmuch as almost all the approximately 3,500 Standard Oil investors in 1899 held very small amounts, special arrangements had to be made to accommodate them. Some owned fractional shares in the twenty companies; others had assignments of legal title; still others held Trust certificates. For convenience, either John D. Rockefeller or H. M. Flagler exchanged recently acquired Jersey Standard shares for fractional and other holdings, which were later turned over to the parent company and consolidated.

15. SONJ, Consol. Accts. of S. O. Interests and of SONJ, 1898-1899; *Ind. Comm.,* I, 565; *U.S.* v. *SONJ,* XIX, 621, Defendant's Exhibit No. 216.

Gross assets of S. O. Interests at the end of 1898 were $256,242,155 and net value was calculated to be $164,173,628.

16. Unless otherwise stated, the material for this section comes from SONJ, Minute Bk.; morgued Corp. Recs., Salary Bks. A, B, C, and D; salary cards; memorial to A. C. Bedford by M. L. Requa before meeting of the American Petroleum Institute; memorial to Folger upon his death; Pay Roll Book, Directors (1910-1931), and cards; short biographical material on directors; *Nat. Cyc. of Am. Biog.,* XVIII, 291; XXII, 67-68; XXIII, 9-10, 13; XXIV, 319, 354; XXXII, 152-153; Vol. A, 325-326; *Dictionary of American Biography*; *The Lamp,* III, No. 5 (Feb., 1921), 8; VI, No. 1 (June, 1923), 5; VIII, No. 3 (Oct., 1925), 9-11; XIII, No. 1 (June, 1930), 12; *U.S.* v. *SONJ,* VII, 53-85; Nevins, *Rockefeller,* II, 9, 10, 257, 356, 444, and 514; Crum and Dungan, *Romance of American Petroleum and Gas,* I, 312, II, 297-298.

17. SONJ, Minute Bk.; Rockefeller Recs., 1899 to 1911, *passim*; interview of R. W. and Muriel E. Hidy with Charles

Heydt, retired secretary of John D. Rockefeller, Mar. 15, 1951.

Rockefeller attended only 6 out of the 135 Directors' meetings from 1893 to 1911, inclusive. Three of the 6 were in the period after 1899.

18. *U.S.* v. *SONJ*, I, 95, 100, 459.

19. Archbold Recs., 1897 to 1899, *passim*.

20. Boyd & Thompson later became R. J. Thompson & Co., then Thompson & Bedford Co., Ltd. (1880). In 1890, Thompson and Bedford sold their remaining holdings to the Trust, and Thompson retired.

21. SONJ, J. D. Rockefeller, Jr., to C. T. White, Jan. 31, 1935.

22. Rockefeller Recs., Rockefeller to Barstow, July 28, Aug. 12, 1908; Rockefeller to J. D. Rockefeller, Jr., Sept. 23, 30, 1909; *Missouri* v. *S. O. Co. (Ind.), Waters-Pierce Oil Co., and Republic Oil Co.*, Testimony, 2491, 2524-2525; E. F. Bradford, registrar, Cornell University, to R. W. Hidy, June 14, 1951.

The subject of W. C. Teagle's senior thesis was "Desulphurization of Crude Petroleum."

23. SONJ, "Stockholders of SONJ, Aug. 31, 1911"; "Analysis of Stock Ledger Showing the Different Classes of Holdings and the Number of Stockholders with the Aggregate Shares in Each Class, from 1901 to 1934."

The document, not specifically dated within 1911, showed the following classification of holdings:

No. of Shares	*No. of Holders*	*Total Shares in Category*
1 to 4	1,665	3,418
5 to 9	994	5,854
10 to 24	1,490	20,452
25 to 49	658	20,578
50 to 99	455	27,887
100 to 199	407	49,603
200 to 299	145	32,101
300 to 399	66	21,319
400 to 499	36	15,148
500 to 999	75	49,393
1,000 & over	110	737,630
	6,101	983,383

24. Rockefeller Recs., Rockefeller to Archbold, July 13, 1907.

25. SONJ, Minute Bk., amended bylaws, 60-63; *New York Herald*, Oct. 6, 1907, magazine section.

The newspaper article indicated the public interest in Standard Oil's committee system and served to give an impression of its working, but it proved to have some inaccuracies when checked against records.

Under Jersey Standard's amended charter, as in similar instruments, the Board of Directors exercised a wide range of powers. They could make, alter, amend or rescind the bylaws of the corporation; fix the working capital; authorize and execute mortgages and liens upon real and personal property; sell, assign, or otherwise dispose of any or all property; raise or lower the number of directors; replace deceased or resigned directors; prescribe the number necessary to constitute a quorum of the Board (which might be less than a majority); designate three or more directors as an Executive Committee; and determine the application of surplus earnings or accumulated profits to the purchase of property.

26. SONJ, Minute Bk., Sept. 19, 1899, July 25, 1904.

27. Data on the committees and staff are derived from a wide variety of sources, the chief ones being the following: SONJ, Minute Bk.; Salary Bks. and cards; morgued Corp. Recs.; accounts of various companies, 1899-1911; *U.S.* v. *SONJ* and other cases; Archbold Recs.; Elliott Recs.; O'Day Recs.; Export Trade Recs.; Dodd Recs., especially Dodd to O. K. Davis, Nov. 13, 26, 1902.

28. Data gathered from the sources listed in Footnote No. 27 were checked against SONJ, "Employees' Register and Pay Roll, Standard Oil Co. of New Jersey," No. 1 (1899-1904) and No. 2 (1905-1916).

The Mechanical Department was really devoted to maintenance, inspection, and research at first; Herman Frasch was carried on its list of salaried workers. The Mechanical Department and the Inspection Department were first listed separately in 1904.

29. SONJ, "Employees' Register and Pay Roll, Standard Oil Co. of New Jersey," No. 1 (1899-1904) and No. 2 (1905-1916), and references cited in Note 27;

Dodd Recs., Dodd to Wade Hampton, Dec. 16, 1903.

30. SONJ, Williams Recs., Williams to Col. E. S. Coe, Dec. 15, 1899; morgued folder on legal affairs.

31. Socony Recs., annual statistical report for 1906.

32. Socony Recs., McGregor to Babcock, Dec. 15, 1899.

33. O'Day Recs., O'Day to Strong, May 18, 1905.

34. *Ibid.*, Carter to Tonkin, Dec. 24, 1903 (quotation); John Bushnell to Carter, Jan. 6, 1904; Payne to O'Day, Jan. 18, 1904.

35. The Carter Oil Co., Minute Bk., June 16, 1906-Feb. 12, 1907.

Managers of Hope Natural Gas had so many disagreements with Carter over the division between the two of payments to landowners under leases of gas wells taken over in 1902 from Carter Oil by that gas company that five years later the contract of 1902 was terminated, bills on Carter were canceled, and all rights under the leases were turned over to the gas company.

36. O'Day Recs., Strong to John Bushnell, Aug. 5, 1902; Tonkin to O'Day, Sept. 23, 1902.

37. *Ibid.*, O'Day to Payne, Oct. 14, 1903; Payne to O'Day, Oct. 13, 1904; *Kansas v. Standard Oil (Indiana) and others*, Testimony, 43-45 (J. E. O'Neill).

38. Interviews of R. W. Hidy with A. F. Corwin, Jan. 3, 10, 1950; Archbold Recs., *passim*.

CHAPTER 12

1. SONJ, copies of agreements of Standard Oil Co. (Iowa) with Pacific Coast Oil Co., Apr. 11, 1895, and Puente Oil Co., Mar. 31, 1898, Jan. 13, 1899; *U.S. v. SONJ*, II, 734-735; XVII, 3508, 3514, 3521; *Oil, Paint & Drug Reporter*, XLVIII, No. 15 (Oct. 7, 1895), 7; LI, No. 23 (June 7, 1897), 7; *Paint, Oil & Drug Review*, XXI, No. 18 (Apr. 29, 1896), 16; XXVI, No. 2 (July 13, 1898), 13.

According to information supplied by Standard Oil Co. (California) from the Minutes of Standard Oil Co. (Iowa), June 22, 1885, the first Standard Oil contract with the Pacific Coast Oil Co. was made in 1885. By the contract of Apr. 11, 1895, the Pacific Coast Oil Co. agreed to sell to the Standard Oil Co. (Iowa) its light products made at Alameda Point. The quantity of Water White kerosene was not to exceed 1,000,000 gallons per year; Standard White not to exceed 350,000 gallons; 74° naphtha not to exceed 500,000 gallons a year. All 58° Baumé benzine was included. The prices were agreed on for the year of the contract, which was renewed annually for several years.

2. *Mineral Resources, 1883-1884*, 218-220; *1885*, 149, 151; *1889-1890*, 290; *1894*, 374; *1895*, 698; *1896*, 841; W. L. Watts, "Petroleum in California," *Cassier's Magazine*, XXI, No. 2 (Dec., 1901), 123-129; *Oil, Paint & Drug Reporter*, LII, No. 14 (Oct. 4, 1897), 25; *Paint, Oil & Drug Review*, XXV, No. 3 (Jan. 19, 1898), 37; Walter Stalder, "A Contribution to California Oil and Gas History," *California Oil World and Petroleum Industry*, XXXIV, No. 21 (Nov. 12, 1941), 33-72.

After some attention in the 1860's, the California industry had had very little development until 1875. Peckham had recommended the use of California oil as fuel as early as 1870 and stated that the crude, although unlike that of Pennsylvania, was a promising fluid for chemical and technological research. A geologist gave an adverse report, and between 1867 and 1875 the industry was almost dormant. The raw material was not suited to the production of kerosene by the known methods, and there was no large neighboring market. Most of the kerosene for California was imported from the East, first by way of the Horn, and then by railroad. In the 1870's new companies were formed and started active development. Prof. Watts, field geologist of the California State Mining Bureau, dated the beginning of the use of petroleum as fuel in California from 1878.

3. Frank J. Taylor and Earl M. Welty, *Black Bonanza* (New York, 1905), 96; S. F. Peckham, "The Technology of California Bitumens," *Journal of the*

Franklin Institute, CXLVI, No. 1 (July, 1898), 48-49.

4. *Mineral Resources, 1885,* 150; *1894,* 374; Henry, *Thirty-five Years of Oil Transport,* 77-78.

5. Rockefeller Recs., W. H. Tilford to Rockefeller, Mar. 30, 1892; Archbold Recs., e.g., H. M. Tilford to Archbold, June 27, 1899, and enclosures; H. C. Folger to Archbold, Dec. 20, 1897; W. Fleming to Archbold, Feb. 28, 1898 (quotation).

6. Archbold Recs., C. F. Lufkin and John F. Eckbert, "Generalized Report of the California Oil Fields," May 29, 1899.

7. Archbold Recs., Report of Lufkin and Eckbert, May 29, 1899 (quotation); H. M. Tilford to Archbold, Sept. 2, 1899; H. C. Breeden to H. M. Tilford, Aug. 28, 1899; Taylor and Welty, *op. cit.*, 109, 111, and 121; J. G. Leigh, "The Trans-Isthmian Pipe Line—Oil as Fuel on the Panama Canal Works," *The Petroleum Review*, XX, No. 450 (May 8, 1909), 263-265.

8. SONJ, C. N. Payne and T. M. Towl to John Bushnell, Oct. 4, 1900 (quotation); John Bushnell to Archbold, Oct. 10, 1900; balance sheet, Apr. 30, 1900; Archbold Recs., Report of Lufkin and Eckbert, May 29, 1899; Taylor, "History of the Standard Oil Co.," 253; "A Short History of Standard Oil Company of California," mimeographed; *Engineering & Mining Journal*, LXV, No. 7 (Feb. 12, 1898), 197; *Mineral Resources, 1883-1884,* 218; "California Oil," *API Quarterly* (Apr., 1948), 6.

9. SONJ, morgued Corp. Recs.; Consol. Accts.; Elliott Recs., H. M. Tilford to Elliott, July 31, 1906, and enclosures; C. T. White to Elliott, Jan. 23, 1907; *U.S. v. SONJ*, XVII, 3405.

The capital of the Pacific Coast Oil Co. was increased to $3,000,000 in June, 1902, and to $6,000,000 in May, 1903. At the latter date, the California Star Oil Works Co., capital $1,000,000, was liquidated. The Standard Oil Co. (Iowa) had a capital of $1,000,000, reduced in 1908 to $1,000.

10. SONJ, morgued Corp. Recs. and Salary Bk. D; information supplied by Standard Oil Co. (Cal.) from Minutes of the Pacific Coast Oil Co. Board, Apr. 21, 1903.

W. S. Rheem was secretary and treasurer of Pacific Coast Oil; then W. S. Miller was given the latter post. L. D. Clarke was comptroller to 1905 followed by A. H. Brainard. The directors of the Pacific Coast Oil Co., and later of the Standard Oil Co. (Cal.), were H. M. Tilford, D. G. Scofield, W. S. Miller, W. M. Hall, and H. C. Breeden; in 1905, W. S. Rheem was added, and Breeden left shortly after. J. A. Moffett and F. H. Hillman replaced Tilford and Hall in 1911.

11. The chief sources of information for this section were the O'Day Recs. (only a few of the voluminous letters and reports are specifically mentioned); E. P. Bly, "Oil Pipe Lines in California," reprint from Aug., Sept., and Oct., 1927, issues of *Oil Bulletin*, n.p. (quotation).

12. O'Day Recs., C. N. Payne to O'Day, Oct. 7, 1903; O'Day to H. H. Rogers, Feb. 4, 1904, refers to a meeting on the California pipelines at which O'Day, C. N. Payne, T. M. Towl, Forrest M. Towl, Joseph Seep, and John Bushnell were present. John Page was in California.

13. O'Day Recs., Charles R. Huntley to O'Day, July 3, 1903; F. M. Towl to O'Day, Aug. 25, 1903; *Mineral Resources, 1908,* 68; interview of Muriel Hidy with Buckner Speed, July 2, 1950; *Engineering & Mining Journal*, LXXVI, No. 11 (Sept. 11, 1903), 390.

The extreme interest in the problem is shown by the fact that Rogers, as well as O'Day, studied and initialed the daily pumping reports of the Pacific Coast Oil Co.

14. O'Day Recs., C. N. Payne to O'Day, June 2, 1903; O'Day to F. M. Towl, May 28, 1903.

15. *Ibid.*, monthly reports on reservoirs, Pacific Coast Oil Co., Pipe Line Division, 1903-1905.

Various methods were utilized to reduce loss from reservoirs. At first tankmen puddled the bottom of a reservoir with oil and allowed light fractions to evaporate. Then they added about one-half inch of dust and rolled the bottom with a five-ton roller. The detailed

records show a considerable reduction of losses in later reservoirs. Loss from Number 7 in the first month was .42% compared with .97% from Number 1 in its first month. In locating tankage, local taxes and fire risks were taken into consideration.

16. O'Day Recs., C. N. Payne to H. H. Rogers, Jan. 29, 1903; C. N. Payne to H. M. Tilford, Jan. 29, 1903; W. Ogg to J. B. Maitland, Jan. 22, 1903; O'Day to H. C. Folger, Jr., Feb. 2, 1903.

Ogg died of cerebral meningitis in California in September, 1903.

17. O'Day Recs., J. Page to O'Day, Nov. 10, 1904.

It cost about $400 per mile to uncover pipe. It took about 1,000 barrels of oil per mile for the treating.

18. O'Day Recs., J. Page to O'Day, Dec. 4, 1903 (quotation), Feb. 17, 29, 1904; William Edwards to L. L. Anderson, Dec. 31, 1903.

By Dec., 1903, Pacific Coast Oil Co. had 5,000,000 barrels of oil in storage and was receiving 20,000 barrels a day. In that month the company had to reduce the amount delivered by taking oil in proportion to the minimum amounts arranged for in contracts. The order was to take into consideration producers' own tankage, so no one would have to shut down.

19. O'Day Recs., O'Day to Page, Dec. 10, 1903.

20. *Ibid.*, O'Day to Rogers, Jan. 7, 1904; O'Day to J. Page, Dec. 10, 1903, June 3, Aug. 29, 1904.

21. *Ibid.*, O'Day to Rogers, Oct. 24, 1904.

When original plans were being made, C. N. Payne recommended a 10-inch pipeline, but others held out for an 8-inch one. The total cost was somewhat more than $6,000 per mile of 8-inch pipe laid. The cost of 9 intermediate stations was estimated at $522,600. The expense of operating each of the pumping stations was $610 per month for labor alone.

22. *Engineering & Mining Journal*, LXXXIX, No. 13 (Mar. 26, 1910), 652; *Mineral Resources, 1905*, 66; *1911*, 98; Federal Trade Commission, *Report of the Federal Trade Commission on the Pacific Coast Petroleum Industry*. Part I, *Production, Ownership and Profits* (Washington, 1921), 228-229.

In 1908 Coalinga, Kern River, and Santa Maria were the ranking fields, producing about nine million barrels each.

23. Archbold Recs., C. F. Lufkin to Archbold, Jan. 15, 1903; J. J. Carter to Archbold, Apr. 19, 1905.

24. SONJ, real estate and tax records (hereinafter cited as Real Estate Recs.), H. G. Morrow to T. M. Towl, Dec. 16, 1908; *Mineral Resources, 1906*, 54; *1907*, 65; *The Petroleum Review*, XXI, No. 455 (July 17, 1909), 35-36; No. 465 (Dec. 4, 1909), 322; *The Oil Age Weekly* (later *Petroleum World*), I, No. 2 (Feb. 4, 1910), 5 and 11, No. 14 (Apr. 29, 1910), 11.

Standard Oil was reported to have acquired nine of the leading properties in the Coalinga and Kern River fields for about $5,000,000 in 1909.

25. Archbold Recs., Lufkin to Archbold, Jan. 15, 1903; Carter to Archbold, Apr. 19, 1905; R. B. Woodworth, "Development and Design of the Steel Oil Derrick," *Engineering & Mining Journal*, LXXXVIII, No. 7 (Aug. 14, 1909), 304-309, reprint from *Proceedings*, Engineer's Society of Western Pennsylvania (June, 1909); *Mining & Engineering World*, XXXVI (June 22, 1912), 1283; *Mineral Resources, 1905*, 52; *1906*, 52-53.

26. "A Splendid Policy," *The Petroleum Review*, XX, No. 448 (Apr. 10, 1909), 218, 224.

27. *Engineering & Mining Journal*, LXXXVIII, No. 16 (Oct. 16, 1909), 788; LXXXIX, No. 22 (May 28, 1910), 1103; XC, No. 11 (Sept. 10, 1910), 496.

During the Roosevelt administration, some 4,000,000 acres in different states were withdrawn from entry; in Sept., 1909, Taft directed that all public oil lands should be withheld from disposition pending study because he considered the placer mining law applicable to such deposits as not suitable and he wished to reserve certain fuel oil deposits for the U.S. Navy; by July, 1910, the outstanding withdrawals amounted to 4,550,000 acres. Judge Curtis H. Lindley gave a speech before the San Francisco Bar Association claiming that this conservation policy was to aid large producers.

28. *Mineral Resources, 1900* to *1911, passim.*

Royalty is figured at one-sixth in this field to get gross from net production.

29. SONJ, Contract Book No. 52, e.g., copy of agreements of Pacific Coast Oil Co. with California Oil Fields Co. (Coalinga), Dec. 31, 1904; with 40 Oil Co. (Coalinga), Mar. 13, 1905; with Pinal Oil Co. (Santa Maria), Mar. 7, 1905; O'Day Recs., J. Page to O'Day, Dec. 8, 1903.

In 1905, oil of 20° and 21° Baumé brought 18 cents per barrel, while that of higher degrees brought correspondingly better prices. Petroleum over 27° sold for 40 to 45 cents.

30. *The Petroleum Review,* XVI, No. 399 (May 25, 1907), 297.

31. SONJ, Contract Book No. 52, copies of contracts of Pacific Coast Oil Co.; George H. Eldridge, "The Petroleum Industry of California," *Engineering & Mining Journal,* LXXIII, No. 1 (Jan. 4, 1902), 41.

32. *Mineral Resources, 1902* to *1906, passim.* Examples of newspaper comments are *Pacific Oil Reporter,* Aug. 27, 1904; *Bakersfield Morning Echo,* Aug. 27, 1904; *Bakersfield Californian,* Aug. 24, 29, 1904; *Coalinga Oil Record,* Mar. 11, 1904; *Los Angeles Times,* Aug. 24, 1904.

Because costs of production varied widely from field to field and well to well, some producers were less able to stand the reduced prices than others.

33. O'Day Recs., J. Page to O'Day, 1903-1904, *passim; San Francisco Chronicle,* Nov. 6, 1903; *U.S.* v. *SONJ,* XVII, 3519, Testimony of Tilford, and XIX, 683, Defendant's Exhibit 284.

In 1904 the Southern Pacific Railroad Co. started to collect royalty oil in the Coalinga field, where it had a gathering system running to its tanks at the station at Ora. The railroad also reserved the right, when leasing its land, to buy all the oil produced on its property.

34. *San Francisco Chronicle,* Nov. 3, 1904; *Bakersfield Californian,* Nov. 9, 1904; *Mineral Resources, 1907,* 64; *1908,* 68; *1909,* 371; *1910,* 91; *1911,* 7; *Oil, Paint & Drug Reporter,* LXXVII, No. 5 (Jan. 31, 1910), 55; *Engineering & Mining Journal,* LXXXIX, No. 7 (Feb. 12, 1910), 364; No. 8 (Feb. 19, 1910), 407; *The Petroleum Review,* XXI, No. 455 (July 17, 1909), 35; XXIV, No. 495 (Jan. 28, 1911), 37; XXV, No. 508 (July 29, 1911), 75-76; Taylor and Welty, *op. cit.,* 128; Federal Trade Commission, *Report of the Federal Trade Commission on the Pacific Coast Petroleum Industry.* Part II, *Prices and Competitive Conditions* (Washington, 1922), 21-22, 37.

35. *Oil, Paint & Drug Reporter,* LXXVII, No. 22 (May 20, 1910), 28; *The Petroleum Review,* XXIII, No. 489 (Nov. 5, 1910), 300; XXIV, No. 495 (Jan. 28, 1911), 37; XXV, No. 508 (July 29, 1911), 75-76.

One critic of the Agency, Union Alliance, pointed out in *The Petroleum Review* that, seeking to be independent of one buyer, members of the Agency had tied themselves "body and soul" to another.

36. *Mineral Resources, 1904,* 195, from data compiled by Paul W. Prutzman of the California Mining Bureau.

Specific gravity of Coalinga crude ranged from a minimum of 32.5° to 34°, averaging 33.3°, while among the 14 other types of California crudes tested the range was as high as 24.5° Baumé. Flash points manifested similar wide variations.

37. *U.S.* v. *SONJ,* XVII, 3493, Testimony of H. M. Tilford; *Mineral Resources, 1907,* 65, records the beginning of Irving C. Allen's analysis of California crudes.

38. SONJ, Pacific Coast Oil Co., analysis of manufacturing business, 1900; U.S. Patent Number 597,920.

For the last eight months of the year "Laboratory Expenses" amounted to $2,841.44.

39. SONJ, Pacific Coast Oil Co., analysis of manufacturing business, 1900; *U.S.* v. *SONJ,* XVII, 3490; O'Day Recs., D. G. Scofield to Folger, Sept. 1, 1903.

40. SONJ, Pacific Coast Oil Co., analyses of manufacturing business, 1900-1906; *U.S.* v. *SONJ,* XVII, 3490-3491; Douglas G. McPhee, "The Story of Standard Oil Company of California," reprinted from

series of articles in California *Oil World*, 13, 18.

41. *Mineral Resources, 1907*, 65; *U.S.* v. *SONJ*, XVII, 3494, 3527, Testimony of Tilford; SONJ, Standard Oil Co. (Cal.), analysis of manufacturing business, 1907; *The Journal of the Society of the Chemical Industry*, XXIII, No. 14 (July 30, 1904), 769.

42. *The Petroleum Review*, XXX, No. 613 (Apr. 18, 1914), 455; *The Journal of the Society of the Chemical Industry*, XXXI, No. 4 (Feb. 29, 1912), 169, 171.

The numbers of the patents, in order of mention, were: No. 968,760, No. 968,-640, and No. 913,780.

In the *Journal* article Frasch referred to his process for treating the peculiar crude oil of Fresno County, California, so as to remove the valuable aromatic hydrocarbons which it contains: benzol, toluol, xylol, mesitylene and naphthalene.

43. R. F. Bacon and W. A. Hamor, *American Petroleum Industry*, 2 vols. (New York, 1916), II, 486-489, 491, 509, 528-532.

44. SONJ, collection of predissolution data; Standard Oil Co. (Cal.), analysis of manufacturing business, 1907; McPhee, *op. cit.*, 13; *Engineering & Mining Journal*, XCI (Feb. 25, 1911), 406.

The estimated loss from the fire was \$500,000, and the burning of the oil in a concrete reservoir in 1910 caused a loss of a reported \$170,000.

45. *The Petroleum Review*, XXI, No. 459 (Sept. 11, 1909), 152; XXV, No. 514 (Oct. 21, 1911), 273; *Engineering & Mining Journal*, XCII, No. 5 (July 29, 1911), 210; *The Standard Oiler*, XIII, No. 2 (Feb., 1951).

46. *The Petroleum Review*, XI, No. 298 (Nov. 19, 1904), 412; *Engineering & Mining Journal*, LXXV, No. 1 (Jan. 3, 1903), 57; XCII, No. 5 (July 29, 1911), 210; William H. Storms, "Growth of the Petroleum Industry in California," *Mining & Engineering World*, XXXVI, No. 25 (June 22, 1912), 1285; Bacon and Hamor, *op. cit.*, 506-509.

47. Storms, *op. cit.*, 1285; Bacon and Hamor, *op. cit.*, 509.

48. Taylor, *op. cit.*, 236.

49. SONJ, Standard Oil Co. (Cal.), analysis of manufacturing business, 1907.

50. *U.S.* v. *SONJ*, XIX, 684, Defendant's Exhibit No. 286.

51. SONJ, old export statistics, F. D. Asche, Oct. 28, 1911; *U.S.* v. *SONJ*, XVII, 3498, Testimony of H. M. Tilford, and XIX, 684, Defendant's Exhibit No. 285; *Mineral Resources, 1911*, 117.

Here, as in other parts of the volume, barrels of 50 gallons have been converted to barrels of 42 gallons.

52. Socony Recs., "Sales of Refined Oil and Gasoline, 1906 to 1911"; *U.S.* v. *SONJ*, XIX, 684; *The Petroleum Review*, XXV, No. 508 (July 29, 1911), 77; Gerretson, *Geschiedenis der 'Koninklijke,'* II, 495-496.

53. *Engineering & Mining Journal*, LXXI, No. 5 (Feb. 2, 1901), 142; L. Stoltz and A. Jamison, *History of the Gas Industry* (N. Y., 1938), 311.

As early as 1899, ten Lowe water-gas and five oil- and air-gas works operated in California and the number grew with the passing years.

54. SONJ, Standard Oil Co. (Cal.), analysis of manufacturing business, 1907; *U.S.* v. *SONJ*, XVII, 3488-3489 (quotation), and XIX, 685-686, Defendant's Exhibit Nos. 287 and 287-A. In the latter, sales in Idaho and part of Montana were included in the calculations.

The ten bulk stations in 1887 were in San Francisco, Los Angeles, Sacramento, San Diego, San José, Oakland, Stockton, Portland, Tacoma, and Seattle. These, plus Spokane and Fresno, were the main stations in 1908.

The tankers were the *Asuncion, Drake, Loomis, Atlas,* and *Maverick*. The last two named were purchased from New York Standard.

55. *U.S.* v. *SONJ*, II, 741-754; VIII, 704-706, Petitioner's Exhibit No. 319; XVII, 3509-3519; and XXI, 101-108, Petitioner's Exhibit No. 944, agreement of Union Oil Co. of California with Pacific Coast Oil Co., dated Feb. 4, 1904; Taylor and Welty, *op. cit.*, 121-125, 160; *Fullerton Tribune*, Aug. 25, 1904.

Tilford testified that Standard Oil bought the kerosene and naphtha business of the Arctic Oil Works, King-Key-

stone Oil Co., F. P. Joyce Oil Delivery, and the Penn Oil Co., though it had refused to buy the lubricating oil operations of King-Keystone.

56. McPhee, *op. cit.*, 16-17.

57. *U.S.* v. *SONJ*, X, 1658-1659, Petitioner's Exhibit No. 635, and XVII, 3500, Testimony of H. M. Tilford; *Fullerton Tribune*, Aug. 25, 1904.

58. *U.S.* v. *SONJ*, X, 1658-1659, Petitioner's Exhibit No. 635.

59. *U.S.* v. *SONJ*, III, 1415, and VIII, 707, and 1002-1009.

During the first six months of 1907, California Standard showed earnings per 50-gallon barrel on kerosene of $0.9263 and on gasoline of $1.01402.

60. Socony Recs., "Sales of Refined Oil and Naphtha and Gasoline, 1906-1911"; F.T.C., *Report on the Pacific Coast Petroleum Industry*, Pt. II, 105.

No evidence has been found to indicate the effect of California's antitrust law of 1907 on these changes.

61. SONJ, balance sheet of Standard Oil Co. (Cal.), 1911, and balance sheet of Standard Oil Co. (Iowa), 1899.

62. SONJ, collection of predissolution data; old export statistics, F. D. Asche, Oct. 28, 1911; Elliott Recs., brief for Standard Oil Co. (Cal.) by Pillsbury, Madison & Sutro in answer to an order of the Interstate Commerce Commission, Mar. 28, 1912; Socony Recs., "Sales of Refined Oil and Gasoline, 1906-1911."

63. O'Day Recs., J. Bushnell to O'Day, June 12, 1903; FTC, *Report on the Pacific Coast Petroleum Industry*, Pt. I, 161.

64. SONJ, dividend records of Iowa Standard, Pacific Coast Oil Co., and California Standard, 1899 to 1911.

65. SONJ, collection of predissolution data; G. P. Bowie, "The Transport of California Crude Oil," *The Petroleum Review*, XXV, No. 513 (Oct. 7, 1911), 237-238.

The three major lines competing with Standard Oil in the San Joaquin Valley together accounted for about 870 miles of the 1,250.

66. *The Petroleum Review*, XXI, No. 457 (Aug. 14, 1909), 98.

CHAPTER 13

1. Archbold Recs., J. J. Carter to Archbold, Jan. 15, 1903; memo by Christy Payne, Apr., 1954.

2. *Mineral Resources, 1911*, 30.

By 1905, production west of the Mississippi accounted for 52% of the quantity but only 23% of the value in the United States.

3. O'Day Recs., J. Bushnell and Wade Hampton to H. H. Rogers, Dec. 13, 1902; interviews of R. W. Hidy with A. F. Corwin, Jan. 4, 1949, Jan. 3, 10, 1950, contributed to the whole section on South Penn; SONJ, collection of predissolution data.

J. C. McKinney was in charge of the Midland Division of South Penn which took over the Forest Oil properties.

4. O'Day Recs., telegram, W. J. Young to J. D. Archbold, Feb. 25, 1904; *Oil, Paint & Drug Reporter*, LX and LXI (1901 and 1902), *passim*, articles on "Petroleum Well Engineering."

Young made daily reports on wells producing over 50 barrels per day. In the report mentioned there were 19 such wells, of which the largest produced 315 barrels daily.

5. O'Day Recs., W. J. Young to O'Day, Dec. 15, 1903; R. B. Woodworth, "Development and Design of the Steel Oil Derrick," *Engineering & Mining Journal*, LXXXVIII, No. 7 (Aug. 14, 1909), 304-309, reprint from *Proceedings*, Engineer's Society of Western Pennsylvania (June, 1909), and XC (Aug. 12, 1911), 296-297.

In his letter Young tells of a drilling contractor using steel wire and of his own promise to try out one of Carnegie Steel's cables made of "nickel steel." At the bottom of the pipe derricks special flange castings, bolted to the sills, were provided into which to screw the legs of the derrick. There were special castings at the top to receive the crown block and the pulley. The steel derricks of 1903 weighed about 24,000 pounds each.

6. O'Day Recs., W. J. Young to J. D. Archbold, Sept. 30, 1904; W. G. Taylor, "The Development and Extent of the Operation of Oil Wells by Electric

Power," *General Electric Review*, XX, No. 6 (June, 1917), 468-469; *The Petroleum Review*, XI, No. 296 (Nov. 5, 1904), 365, interview with an engineer, A. Beeby Thompson, after his visit to West Virginia; W. F. Patton, Jr., "Electric Power for Oil Wells," *The Petroleum Review*, XXIV, No. 502 (May 6, 1911), 259-261. Patton gives the number of electric motors installed by South Penn from 1903 to 1907 as 450.

7. SONJ, Security Committee, Letter Bk., T. C. Bushnell to L. D. Clarke, Mar. 30, 1901; O'Day Recs., O. S. June to O'Day, Sept. 19, 1904; The Carter Oil Co., Minute Bk., Mar. 2, 1901, to Dec. 23, 1909; James L. Darnell and Arthur Eaton, "The Carter Oil Co., Eastern Division Valuation Report, Producing Properties, 1913-1919," 25 vols., *passim*.

In the Middaugh and Bremen districts in Ohio, Carter made a large group purchase of leases in 1907 and 1911 from the Bremen Gas & Oil Co.; the whole working interest of most of the leases was bought, but in some only a 1/16 royalty was acquired.

There was a considerable and successful development in Rowells Run District, Calhoun County; some 26 leases were acquired and 136 wells drilled, of which 122 produced with an initial production of from 2 to 470 barrels, and a median of 20.

No dividends were declared in 1900 and 1901, and the first minute book ends with 1909. For the first seven years, 1893 to 1899 inclusive, dividends amounted to $1,415,000, or an average of 20.4% on the capital stock of $1,000,000.

8. SONJ, Corp. Recs.; O'Day Recs., C. N. Payne to O'Day, May 1, 1903 (quotation); C. N. Payne to J. Bushnell, Nov. 15, 1904; Pittsburgh *Dispatch*, Apr. 19, 1904.

It cost $1,450 a mile to lay 6-inch pipe in Kentucky, compared with $1,200 in West Virginia and $800 in Ohio.

9. Unless otherwise stated, the material in the following pages comes from O'Day Recs.

J. N. Pew was using Beaumont Oil at his new refinery in Philadelphia, but there were so many protests at the odor that he, too, was making every effort to get Pennsylvania crude.

10. O'Day Recs., A. D. McVey (Sistersville) to O'Day, Dec. 26, 1903.

11. *Ibid.*, John O'Brien to O'Day, Jan. 13, 1903.

The reports of The Eureka Pipe Line Co. were less filled with references to loss of wells than those of the Macksburg Division of Buckeye Pipe Line, South-West Pennsylvania Pipe Lines, and National Transit Co., United Pipe Line Division.

Among the competitors were The Pure Oil Co., Ltd., Producers' and Refiners' Oil Co., Ltd., Valvolene Oil Co., John Ellis & Co. (Warren, Pa.), and several refining companies.

12. O'Day Recs., O'Day to H. L. Scrafford, Nov. 10, 19, 1903.

13. A. Smedley headed the Engineering Dept. The Telegraph Dept. leased some wires on a yearly basis and constructed some of its own.

14. O'Day Recs., Seep to O'Day, Nov. 20, 1903; Fayette B. Dow and Donald C. O'Hara, *The National Petroleum Association* (Washington, D. C., c. 1952), 26-27.

15. O'Day Recs., C. N. Payne to O'Day, July 7, 18, 1903; C. N. Payne to John L. Porter, Enlow Oil Co., Oct. 28, 1903.

16. O'Day Recs., W. J. Young to O'Day, Nov. 17, 1903.

Young wrote, "As a general rule, I do not approve of this [awarding drilling contracts to producers], for I am of the opinion that the information they get when drilling for us is used against the producing business."

17. O'Day Recs., Seep to O'Day, Sept. 24, 1903, June 16, 1904.

18. *Ibid.*, O'Day to H. H. Rogers, June 6, 17, 1904; O'Day to Seep, Nov. 5, 1903; T. N. Barnsdall to O'Day, Nov. 27, 1903; Seep to O'Day, Nov. 9, 1903; *Pittsburgh Times*, Nov. 15, 1903.

The loan to Barnsdall was for $100,000. Its purpose was to pay off $35,000 in debt and to provide working capital for developing The Anna Oil Co. (capital stock $25,000) in Monroe County, Ohio. The decision was made the same day the case was presented in Room

1400, without investigation, merely on Barnsdall's promise "to carry out in good faith any promises or agreement" that Seep might make for him.

19. The storage charge of The Eureka Pipe Line Co. was fixed at 25 cents by West Virginia legislation, but other pipelines could vary their rate. According to other lines' contracts, storage charges ranged from 25 cents to 40 cents per thousand barrels per day according to the price of petroleum.

20. O'Day Recs., O'Day to H. L. Scrafford, June 13, 1904.

21. *Ind. Comm.*, I, 576-577; O'Day Recs., correspondence of O'Day and C. N. Payne, *passim;* P. S. Trainor's "Market Prices for Crude Oil," Apr. 22, 1903 (the prices were written in on a printed form); *Mineral Resources, 1906,* 19; *U.S.* v. *SONJ*, II, 653.

In the list of crude oil prices dated 10 o'clock, Apr. 22, 1903, and issued by P. S. Trainor, who had succeeded Henry Lewis as head of the Crude Purchasing and Carrying Department, there were 17 classifications of crude petroleum. These included one grade for Canada, two for Texas, two for Kansas, three for the Lima-Indiana field, one for ordinary Pennsylvania-grade, and eight other classifications for the Appalachian region. About 90 per cent of the oil in the Appalachian area was classified as Pennsylvania-grade. Prices ranged from 50 cents for Texas crude to $1.98 for Canadian, with Tiona, a quality grade in Pennsylvania, being priced at $1.68 per barrel.

22. O'Day Recs., C. N. Payne to O'Day, Feb. 16, 1904, and undated memorandum; Socony Recs., New York Standard Minute Bk., July 3, 1902.

23. O'Day Recs., J. O. O'Brien to O'Day, Dec. 6, 26, 1902; W. H. Norton to J. H. Snow, Dec. 19, 1902; W. H. Norton to Standard Oil Co., June 3, 1903; Norton to O'Day, Nov. 5, 1904; W. Dillon to O'Day, Jan. 22, Feb. 12, 20, 1905.

24. *Allegany County Democrat,* May 4, 1904, June 30, 1904.

25. O'Day Recs., O'Day to Archbold, Dec. 11, 1903.

26. The material for this section is drawn from SONJ, Elliott Recs., 1898-1911, *passim;* O'Day Recs., 1902-1906, *passim;* SONJ, morgued Corp. Recs.; morgued corporation charters; financial reports of various companies; interview of R. W. Hidy with Christy Payne, Aug. 2, 1949; Taylor, "History of the Standard Oil Co.," 366-376; Christy Payne, "Natural Gas Interest of Standard Oil Company (New Jersey)," *The Lamp*, III, No. 5 (Feb., 1921), 21-22; Wallace B. Gribble, "Cradle of Aladdin," *The Lamp*, XVI, No. 4 (Dec., 1933), 22; F. H. Oliphant, "The Transportation of Petroleum and Natural Gas," *The Petroleum Review*, XIII, No. 334 (July 29, 1905), 83.

27. The companies affiliated with the National Fuel Gas Co. in 1902 were The Buffalo Natural Gas Fuel Co., the United Natural Gas Co., the Salamanca Gas Co., The Provincial Natural Gas & Fuel Co. of Ontario, Ltd., The Oil City Fuel Supply Co., the Commercial Natural Gas Co., and the Pennsylvania Gas Co.

28. The three gas companies held in whole or in part by Jersey Standard or its affiliates in early 1892 were the North Western Ohio Natural Gas Co., The Mahoning Gas Fuel Co., and Lawrence Natural Gas Co., not counting the .7 of 1% interest of Jersey Standard in the United Gas Improvement Co.

In 1892 the Commercial Natural Gas Co. was organized to take over gas properties from Forest Oil, and The Mountain State Natural Gas Co. was created to perform the same function for South Penn as well as to supply gas to Sistersville and other towns along the Ohio River. Two years later Standard Oil men joined some outsiders in organizing The River Gas Co., a producer and distributor in southeastern Ohio.

29. O'Day Recs., J. Bushnell to C. N. Payne, Oct. 1, 1903. With but few exceptions, such as The New Domain Oil & Gas Co. in Kentucky and The Prairie Oil & Gas Co. operating in Kansas and Oklahoma, separate producing companies were established for producing petroleum and natural gas.

30. O'Day Recs., O'Day to H. H. Rogers, July 1, 1902, and notation, July 7, 1902; John Bushnell to O'Day, June 30, July 11, 1902; Robt. S. Hampton to J. Bushnell, July 3, 1902.

31. *Ibid.*, O'Day to H. H. Rogers, July 1, 1902.

32. Joseph Seep, M. W. McMahon, and John Tonkin often met with this group. W. W. Richardson was later added.

33. SONJ, Ralph E. Davis, "Reserve Gas Company Valuation Report of Producing and Gas Properties with Calculations showing Depletion and Depreciation sustained, Mar. 1, 1913–Dec. 31, 1921," 1-2; Elliott Recs., A. C. Bedford to Elliott, Aug. 16, 1910.

34. O'Day Recs., O'Day to H. H. Rogers, July 1, 1902.

35. SONJ, morgued corporate charter; O'Day Recs., O'Day to M. B. Daly, Jan. 9, 1903.

36. *Cleveland Leader*, Mar. 14, 1904.

37. O'Day Recs., O'Day to Payne, Jan. 9, 1903.

38. *Ibid.*, J. Bushnell to Rogers, Dec. 14, 1903, May 24, 1904, Jan. 31, 1905; O'Day to Rogers, May 17, 18, 1904; O'Day to John Tonkin, Dec. 20, 1902.

One of the reasons it was so difficult to calculate real costs in the case of the Hope Natural Gas Co. was that most of the development work had been done to find oil for the South Penn. The Depreciation Committee was active by 1903.

39. O'Day Recs., O'Day to Rogers, Dec. 18, 1903; O'Day to Payne, Jan. 9, 1903; Walter Jennings to O'Day, Nov. 2, 1901.

40. E. Strong, J. N. Pew, C. N. Payne, Christy Payne, and Daniel O'Day were the directors of The Peoples Natural Gas Co. and the Pittsburgh Natural Gas Co. in 1903.

41. The presidency of Hope Natural Gas Co. after 1906 was held consecutively by O'Day and C. N. Payne until 1908.

42. SONJ, Ralph E. Davis, "Value of Gas Wells and Leaseholds, Mar. 1, 1913" ("Depletion of Gas properties based on value March 1, 1913 and Capitalized Cost Thereafter"), 1923; Elliott Recs., Folger to Elliott, Aug. 10, 1911; *The Petroleum Review*, XXV, No. 512 (Sept. 23, 1911), 200; George A. Burrell, "The Suitability of Natural Gas for Making Gasoline," *ibid.*, XXX, No. 619 (June 13, 1914), 677.

43. Christy Payne, "Natural Gas Interests of Standard Oil Company (New Jersey)," *The Lamp*, III, No. 5 (Feb., 1921), 21-22; *Mineral Resources, 1911*, II, 282. The statistics for natural gas before 1911 are incomplete and permit only rough comparison. Affiliates of Standard Oil sold 39 billion cubic feet of natural gas in 1902 out of 281 billion cubic feet consumed in the United States.

44. O'Day Recs., E. R. Brown to C. N. Payne, July 9, 1902; correspondence, C. N. Payne and O'Day, 1903, with J. D. Archbold's penciled notes, *passim;* Archbold Recs., H. C. Folger, Jr., to J. D. A., May 23, 1901; Elliott Recs., Elliott to F. Q. Barstow, Feb. 16, 1903; *U.S.* v. *SONJ*, I, 287-300 (H. C. Folger, Jr.), 317-321 (C. N. Payne); *Engineering & Mining Journal*, LXXI-LXXII, *passim*.

Standard Oil's expert on production, C. F. Lufkin, was reported to have predicted a short life for Spindletop. (Henry, *Thirty-five Years of Oil Transport*, 77.)

45. Elliott Recs., J. S. Cullinan to O'Day, Oct. 19, 1904.

46. *Mineral Resources, 1911*, 11-12.

47. Elliott Recs., Elliott to H. H. Rogers, Apr. 20, 1904; correspondence of Elliott with W. J. Young, R. W. Cummins, J. B. F. Cates, John Bushnell, Alfred D. Eddy, O. A. Evans, and Burr A. Towl, *passim*. Much information for this entire section comes from these letters.

48. SONJ, Consol. Accts. of SONJ, 1900-1911; Elliott Recs., *passim; Kansas* v. *Standard Oil Co. (Indiana), The Standard Oil Co. (Kansas), and The Prairie Oil & Gas Co.*, Testimony, *passim*.

By 1911, $18,000,000 of stock had been subscribed to, at par.

49. Elliott Recs., *passim*, esp. Elliott to J. D. Archbold, Feb. 9, 1905; O'Day Recs., *passim*, esp. D. J. O'Day to O'Day, Dec. 21, 1904; *Kansas* v. *Standard Oil Co. (Ind.), The Standard Oil Co. (Kans.), and The Prairie Oil & Gas Co.*

D. J. O'Day, who was in charge of the pipeline construction, wrote, "So far as we are concerned, we have nothing to fear in an investigation."

After the inspection tour of 1904, J. E. O'Neill, trained in the Ohio field, was put in charge of production and later made general manager of Prairie Oil & Gas.

50. Elliott Recs., *passim;* Archbold Recs., report of operations in Osage Nation to May, 1904; inspection trip, May-June, 1904; Counsel for The Prairie Oil & Gas Co., *The Oklahoma Oil Situation*, booklet, Apr. 27, 1909; *Pittsburgh Dispatch*, Oct. 2, 1904; W. A. Whitaker, Clarence Estes, and F. W. Campbell, "The Petroleum Industry of Kansas," *Engineering & Mining Journal*, CV, No. 18 (May 4, 1918), 817-819.

51. Lease of James Bigheart and Saucy Chief to Edwin B. Foster, Mar. 16, 1896; Act for the Protection of the People of the Indian Territory and for other Purposes, June 23, 1898, 58th Congress, 2d Session, House of Representatives Document No. 376; Public Act No. 112, Mar. 1, 1901; Public Act No. 228, July 1, 1902; Public Act No. 241, July 1, 1902; Public Act No. 112, Mar. 3, 1905; Forms A and B, Oil and Gas Mining Lease, Cherokee Nation; regulations governing the leasing of lands in the Cherokee Nation, Jan. 21, Mar. 4, 1903, Mar. 20, May 23, June 8, Dec. 27, 1905, May 22, 1906, June 11, 1907, Apr. 20, 1908, Mar. 3, 1909; Report on the Five Civilized Tribes, 59th Congress, 2d Session, Senate Report No. 5013, 1906; Elliott Recs., 1902-1909, *passim;* Box 85, *passim*, esp. W. J. Young to Secretary of the Interior, Sept. 11, 1903; O. A. Evans to J. D. Archbold, Apr. 28, 1903; O. A. Evans to W. J. Young, June 16, 1904.

52. SONJ, collection of predissolution data; O'Day Recs., John O'Brien to O'Day, Oct. 12, 1904; Archbold Recs., American file, J. E. O'Neill to J. F. Archbold, Jan. 22, 1907.

53. Elliott Recs., W. J. Young, Barnsdall Oil Co., to Elliott, Dec. 4, 1906; Elliott to Earle W. Evans, Jan. 6, 1908; Elliott to Archbold, Jan. 21; J. I. Buchanan, pres., Pittsburgh Trust Co., to Elliott, July 14, 1909; Elliott to R. W. Cummins, May 11, 1911, May 6, 1912; *U.S.* v. *SONJ*, III, 1422 (Testimony, W. Rockefeller), XVII, 3402-3403 (Testimony, J. D. Archbold); *Mineral Resources, 1907*, 48.

The loan was first made by Standard Oil Co. of New York and transferred to Standard Oil Co. (N.J.). Elliott wrote to Earle W. Evans, "It has been said many times that we were interested with Barnsdall. That is not true except some of his stocks have been put up with us to secure loans. We have no other interest in any of his property."

54. Elliott Recs., Elliott to O'Day, Sept. 24, 1904; Elliott to J. G. Slonecker, Dec. 3, 1904; O'Day Recs., O'Day to M. Cudahy, July 22, Dec. 30, 1903; O'Day to Henry McSweeney, June 29, 1904; Price Election Form of The Prairie Oil & Gas Co., 1906.

55. O'Day Recs., C. N. Payne to O'Day, Jan. 6, 1905; *Mineral Resources, 1905*, 42-44; *Kansas* v. *Standard Oil Co. (Indiana), The Standard Oil Co. (Kansas), and The Prairie Oil & Gas Co.*, Testimony of J. E. O'Neill, 44-46 and 107; *U.S.* v. *SONJ*, XVI, 2661, 2693, 2715.

Until 1904 the classification of Kansas oil was in three categories: South Neodesha, North Neodesha, and heavy. It was as a result of a study made by a committee of refiners that the new Robinson gravity method of classification by degrees Baumé was introduced at the end of 1904. When the two categories were adopted in 1909, 32° Baumé was set as the dividing line, although in practice 30° Baumé was used. About 95% of production in Oklahoma was of the higher-gravity oil.

56. *U.S.* v. *SONJ*, XVII, 3238 (quotation); *Mineral Resources, 1895*, 648; O'Day Recs., G. Chesebro' to D. J. O'Day, Sept. 28, 1903; O'Day to C. N. Payne, Oct. 26, 30, 1903.

57. *U.S.* v. *SONJ*, XVII, 3237.

58. O'Day Recs., O'Day to W. J. Young, June 1, 1903.

In the summer of 1903, when for a few weeks Standard could not take all the oil in Kansas, O'Day, backed by Archbold, wrote to W. J. Young:

> We are straining every nerve to get iron tankage constructed and on the ground, but it is very slow work in getting material. It is possible that some of the wells may have to be shut down, and we feel that in case this becomes necessary because of our inability to take temporary care of the oil, that it would be better to shut

down wells belonging to your Company. . . . Our purpose in this would be to prevent as far as possible giving any one reason to go into competition with us.

59. Elliott Recs., Dec., 1902-Mar., 1904, *passim;* O'Day Recs., *passim;* an act authorizing the Secretary of the Interior to grant rights of way for pipelines through Indian Territory, Public Law No. 45, Mar. 11, 1904; Regulations, Apr. 8, 1904.

60. O'Day Recs., correspondence of W. F. Gates, D. J. O'Day, and A. S. Maitland; *The Petroleum Review,* XIV, No. 358 (Jan. 13, 1906), 23-24.

Tanks cost about 21 cents per barrel of petroleum capacity to construct. Provisions for fire insurance, repairs, and maintenance increased the cost.

61. O'Day Recs., O'Day to Michael Cudahy, Apr. 19, 1905.

62. O'Day Recs., O'Day to T. M. Towl, Sept. 23, 1904.

63. O'Day Recs., correspondence of T. M. Towl and John Bushnell, Sept., 1904, to June, 1905, *passim.*

O'Day first had hoped to build 460 miles and 8 stations in six months. John Bushnell wrote to O'Day, Sept. 23, 1904: "It would be false economy to do the work faster than good construction would demand."

64. *The Petroleum Review,* XIII, No. 339 (Sept. 2, 1905), 177 and 189; XIV, No. 363 (Feb. 17, 1906), 134.

65. *Kansas* v. *Standard Oil (Indiana), Standard Oil (Kans.), and Prairie Oil & Gas,* Findings of Fact, 8; *Petroleum Review,* XIV, No. 336 (Mar. 10, 1906), 187; XV, No. 377 (July 21, 1906), 46; No. 386 (Nov. 24, 1906), 297.

66. Counsel for The Prairie Oil & Gas Co., *The Oklahoma Oil Situation,* Apr. 27, 1909; *Mineral Resources, 1909,* 348; *The Petroleum Review,* XV, No. 388 (Dec. 22, 1906), 335; XVII, No. 407 (Sept. 14, 1907), 156; *Oil, Paint & Drug Reporter,* LXXVII, No. 8 (Feb. 21, 1910), 46-55; *Oil Investor's Journal,* VIII (Aug. 20, 1909), 3.

67. *Kansas* v. *Standard Oil (Indiana), Standard Oil (Kans.), and Prairie Oil & Gas,* Testimony, 101.

68. Elliott Recs., 1907-1909, *passim,* esp. Elliott to James K. Jones, July 14, 1909, and J. G. Milburn to Secretary of the Interior, Sept. 30, 1909; *Kansas* v. *Standard Oil Co. (Ind.), Standard Oil (Kans.), and Prairie Oil & Gas,* Testimony, 93-95 (J. E. O'Neill); *Oil Investor's Journal,* VIII (Aug. 20, 1909), 3 and 23, including O'Neill's reply, Aug. 14, 1909, to Mid-Continent Oil & Gas Producers' Association.

69. Elliott Recs., 1907-1909, *passim; Kansas* v, *Standard Oil Co. (Ind.), Standard Oil (Kans.), and Prairie Oil & Gas,* 93-95 (J. E. O'Neill); Counsel for The Prairie Oil & Gas Co., *The Oklahoma Oil Situation,* Apr. 27, 1909. This pamphlet states that the regulations of the Secretary of the Interior of Dec. 21, 1906, were not considered so "just, fair and practicable" as those of Apr. 8, 1904.

70. Elliott Recs., J. G. Milburn to Secretary of the Interior, Sept. 30, 1909; John G. Milburn to G. W. Wickersham, Oct. 11, 1912; *The Petroleum Review,* XV, No. 383 (Oct. 13, 1905), 193; XVII, No. 404 (Aug. 3, 1907), 72.

From 1906 to 1908, when production in Texas was declining, Prairie had shipped small amounts of crude oil by tank car to the refineries at Corsicana and Beaumont.

71. SONJ, Corp. Recs.

Standard Oil Co. of Louisiana had as its first board of directors F. W. Weller (president), H. M. Tilford, A. C. Bedford, P. S. Morris, and R. C. Bemiss, whose place was soon taken by A. K. Gordon.

The Louisiana Standard's pipeline was constructed by C. K. Clarke, superintendent of the Crude Department and in charge of pipelines.

72. Elliott Recs., correspondence of Elliott, W. S. Fitzpatrick, and James K. Jones, 1909-1910, *passim;* Erasmus Haworth, "Oil and Gas in the Mid-Continent Field," *Engineering & Mining Journal,* LXXXIX, No. 2 (Jan. 8, 1910), 132-133; *Mineral Resources, 1910,* 67.

Only $750,000 of the stock of the Oklahoma Pipe Line Co. was issued in these years.

73. Erasmus Haworth, "Oil and Gas in the Mid-Continent Field," *Engineering*

& Mining Journal, LXXXVII (Jan. 9, 1909), 96-97, and XCI, No. 1 (Jan. 7, 1911), 91-92; *Mineral Resources, 1908,* 45.

74. SONJ, leases, contracts and agreements, agreement, Alfred C. Bedford and Standard Oil Co. of Louisiana; J. C. Trees and M. L. Benedum to A. C. Bedford, Dec. 28, 1910; F. Ray McGrew, "Historical Sketch of Pipe Lines, Standard Oil Company of Louisiana," Dec. 13, 1923; *Missouri* v. *Johnson,* 1912, Testimony of D. R. Weller, 35-39, 655-660, 717; *Mineral Resources, 1906,* 49; S. T. Mallison, *The Great Wildcatter* (Charleston, W. Va., 1953), 184-211.

75. SONJ, accounts of National Transit Co., 1911.

76. *New York Times,* Nov. 26, 1899.

77. O'Day Recs., monthly field statements, Lima Division, 1903 and 1904; D. J. O'Day to H. H. Rogers, Nov. 3, 1903; D. J. O'Day to O'Day, July 18, 1903, Jan. 30, May 10, July 5, 1904; J. O'Brien to D. J. O'Day, Apr. 26, May 3, 1905; *Missouri* v. *Johnson,* Testimony, 610-611.

78. SONJ, collection of predissolution data; Elliott Recs., Elliott to John G. Milburn, Feb. 24, 1910.

79. *Mineral Resources, 1905,* 40; *1906,* 32; *1907,* 31-32; *1910,* 61; *1911,* 62; Frank W. De Wolf, "The Illinois Petroleum Developments during 1907," *The Petroleum Review,* XIX, No. 433 (Sept. 12, 1908), 153; Raymond S. Blatchley, state geologist, "Petroleum in Illinois in 1910," *Engineering & Mining Journal,* XCI, No. 1 (Jan. 7, 1911), 92.

80. SONJ, collection of predissolution data.

81. O'Day Recs., D. J. O'Day to John Bushnell, Dec. 14, 1904, Jan. 21, 1905 (telegram); C. N. Payne to W. P. Cowan, Mar. 23, 1905; O'Day to D. J. O'Day, Jan. 26, 1906.

82. Elliott Recs., Elliott to Donnell, July 27, 1906; Donnell to Elliott, Aug. 7, 1906; *The Ohio Oil Company, 60th Anniversary, 1887-1947,* 20-21; Raymond S. Blatchley, "Illinois Oil Industry: Its History and Development," *Mining & Engineering World,* XXXVI, No. 25 (June 22, 1912), 1294; *The Petroleum Review,* XIX, No. 433 (Sept. 12, 1908), 153.

83. SONJ, John W. de Groot to Homer Eagles, July 20, 1949; *U.S.* v. *SONJ,* I, 331-334, 341, and 360 (C. N. Payne).

84. SONJ, collection of legal papers on the subject, J. W. Van Dyke, general manager, The Atlantic Refining Co., to H. C. Folger, Jr., Mar. 8, 1910; H. C. Folger, Jr., to Elliott, Mar. 28, 1910.

85. *U.S.* v. *SONJ,* XIX, 621; "The Transportation of Petroleum in America, A Triumph of Engineering and Mechanical Skill," *The Petroleum Review,* XIII, No. 351 (Nov. 25, 1905), 422.

CHAPTER 14

1. *U.S.* v. *SONJ,* I, 284-285, Folger Testimony; interview of John S. Ewing with G. Harrison Smith, Dec. 23, 1948.

2. SONJ, Argand Refining Co., Minute Bk., Certif. Bk., and misc. recs.; O'Day Recs., Payne to O'Day, Nov. 28, 1904; *U.S.* v. *SONJ,* XVII, 3298-3340, Archbold Testimony.

3. *U.S.* v. *SONJ,* I, 232-242, and XVII, 3298-3340, *passim; Missouri* v. *Standard Oil Co. (Indiana), Waters-Pierce Oil Co., and the Republic Oil Co.,* Testimony, 2470-2471 (W. C. Teagle).

4. Nevins, *Rockefeller,* I, 366.

5. SONJ, "Total Crude Oil Distilled—All Works—42's Daily," 1906-1925, and "Total Crude Oil Distilled N. Y. Seaboard, Baltimore, Charleston & Parkersburg," 1906-1928.

6. Elliott Recs., Folger to Elliott, Oct. 19, 1911. According to the Census Reports for 1904 and 1909, the total number of refineries in California rose from 19 to 29, in Illinois from 0 to 8, and in Kansas from 1 to 18, those three states contributing 35 out of the net increase of 49 for the country as a whole.

In the *Report of the Commissioner of Corporations on the Petroleum Industry,* Part I, *Position of the Standard Oil Company in the Petroleum Industry* (Washington, 1907), 14-15, Standard Oil was credited with 84.2% of the crude oil consumed by all refineries in the country in 1904. The commissioner arrived at that

figure by grouping with Standard Oil the Security and Corsicana plants, as well as Tide Water and two small companies partly owned but not managed by Continental Oil in Colorado. In 1911 the shares owned by Continental in United Oil Co. amounted to 3,400 out of 20,007 issued, each with a par value of $100. (SONJ, Corp. Reg. and Consol. Accts. of SONJ, 1899-1911.)

7. Export Trade Recs., W. C. Teagle to DAPG, Feb. 17, 1913. Teagle also gave data to prove that estimates of crude oil consumption based on capacity had led the Bureau of the Census to exaggerate the throughput of independent refiners in 1909.

8. The material for this section on location problems is based upon a study of evidence scattered throughout SONJ, collection of predissolution data; Elliott Recs., 1901-1911, *passim;* Export Trade Recs., 1901-1911, *passim; Reports of the Commissioner of Corporations on the Petroleum Industry,* 1906-1907; and testimony in various legal cases.

9. Archbold Recs., Lufkin to Archbold, July 5, 1897.

10. For want of statistics, the refineries owned by the partnership of Payne & Folger at Beaumont and Corsicana and that belonging to United Oil Co., an affiliate of Continental Oil Co., are omitted from this analysis. Their inclusion would not change the percentages appreciably. The refinery of the Security Oil Co. near Beaumont piped its products to Sabine and shipped 83% of them by water (*Beaumont Enterprise,* May 5, 1908); Corsicana, an inland refinery, had a small capacity (1,000 barrels daily) when it began operation, which was larger than the plant of United Oil at Florence, Colorado.

11. The map presented opposite page 80 in the *Report of the Commissioner of Corporations on the Petroleum Industry,* Part I, is only a very rough approximation of the domestic markets of the various Standard Oil refineries for illuminating oil in 1904. The advent of Wood River, Baton Rouge, and El Segundo further modified the pattern, and no attempt has been made to construct such a map for 1911.

12. SONJ, analyses of manufacturing business, Consol. Accts. of the S. O. Trust and S. O. Interests, 1884-1897; *Mineral Resources, 1900,* 566, 570.

13. *Mineral Resources, 1900,* 596.

14. Bacon and Hamor, *American Petroleum Industry,* II, 543-552; M. P. de Boissieu, "Present State of the Petroleum Industry," *The Journal of the Society of the Chemical Industry,* XIII, No. 8 (Aug. 31, 1894), 795.

15. SONJ, a collection of letters on patent matters (hereinafter cited as Patent Recs.), McGowan to F. Q. Barstow, Dec. 24, 1886.

16. Bacon and Hamor, *op. cit.,* 533-543.

17. See Chapter 4.

18. A. von Grölling, "Petroleum: Application of Continuous Distillation to," *The Journal of the Society of the Chemical Industry,* XIX, No. 4 (Apr. 30, 1900), 337, citing *Petr. Ind. Techn. Rev.,* II (52), 130-131.

19. SONJ, collection of predissolution data; *Petroleum Industry,* 106. Numerous patents for improved paraphernalia in continuous distillation of crude were issued in Europe; among the patentees were von Grölling, Barbet, Fischer, and Wernecke prior to 1912.

20. Obituary booklet on John Wesley Van Dyke; SONJ, Salary Bks. and cards; brief history of Atlantic Refining.

21. The Institution of Petroleum Technologists, *Twenty-five Years Retrospect, 1910-1935* (London, 1935), 82-83.

22. SONJ, Bayonne inventory cards; Bayway inventory cards; outline of talk by W. F. Thiede, 1947; Bayonne Cost & Yield Statements, loose paper containing inventory of stills and still capacity, Jan. 1, 1912. The sources differ as to the number of crude stills at Bayonne in 1911; thirty-three may have been inoperative at the end of the year. The loose-sheet inventory listed for the refinery 84 tower stills and 77 batch stills for crude distillation, exclusive of 2 in use by the Vacuum Oil Co. For Bayway, Thiede estimated 52 stills; inventory cards show 66 in operation.

23. A. E. Dunstan, A. W. Nash, B. T. Brooks, and Sir Henry Tizard, editors,

The Science of Petroleum, 4 vols. (London, etc., 1938), II, 1466.

24. SONJ, Salary Bks.; Lepley Recs., B. H. Lepley to C. O. Meyer, Oct. 2, 1923.

25. Bayonne Appropriations Recs.; Lepley Recs., B. H. Lepley to C. O. Meyer, Oct. 2, 1923.

26. SONJ, Consol. Accts. of SONJ, 1899-1907, analyses of manufacturing for Bayonne, Baltimore, Parkersburg, and Eagle, 1899-1907, and misc. papers; Bayonne Cost & Yield Statements.

27. Bayonne Appropriation Recs.

28. Lepley Recs., Lepley to Meyer, Oct. 2, 1923; Bayonne Appropriation Recs.

29. Bayonne Appropriation Recs.

30. *Ibid.*; *Oil, Paint & Drug Reporter*, LVII, No. 20 (May 14, 1900), 8, and LVIII, No. 2 (July 9, 1900), 7-8.

31. SONJ, supplemental report of E. H. Porter, Commissioner of Health, to Gov. Charles E. Hughes, on Constable Hook Smoke, Nov. 19, 1909 (quotation); Bayonne Appropriation Recs.; O'Day Recs., Payne to O'Day, Oct. 11, 1902, Jan. 12, June 30, 1904; Williams Recs., T. J. Williams to C. M. Pratt, Dec. 18, 1902; *The Gilbarco Story*.

Williams recommended that Standard Oil buy the Cleveland Foundry Co., makers of the Perfection lamps, stoves, and heaters, and expand. He thought the total investment need not exceed $250,000. Although the executives of the appliance fabricating concern were not unwilling to sell, the deal was never concluded, as far as available records reveal.

32. SONJ, Consol. Accts. of SONJ, 1899-1911; trial balances and balance sheets of constituent companies; Corp. Recs., morgued leases, contracts, and agreements (Interstate Cooperage); Bayonne Appropriation Recs.; Export Trade Recs.; interview of R. W. Hidy with C. G. Nelson (Socony Paint Products Co.), Mar. 30, 1949; The Standard Oil Co. (Ohio), *75th Anniversary* (Cleveland, 1945), 18 (picture of tank-wagon plant).

33. H. J. Howland, "Standard Oil," *The Outlook*, LXXXVII, No. 4 (Sept. 28, 1907), 171.

34. News reports in various newspapers and technical periodicals; Bayonne Appropriation Recs.

35. Compare outline of talk by W. F. Thiede, 1947.

36. Lepley Recs.; Bayonne Appropriation Recs.; untitled memorandum on the history of the Bayonne Refinery.

37. *The Esso Refiner*, Aug. 27, 1945; *The Jersey Journal* (Jersey City), Aug. 12, 1946; interviews of R. W. Hidy with Joseph A. Smith, head of the laboratory at the Baltimore Refinery, with M. H. Hays, foreman of the Bayonne main laboratory, and others at Socony-Vacuum and the Pittsburgh Grease Works of Standard Oil Co. (Pennsylvania).

38. Howland, *op. cit.*, 174.

39. Memo on the history of the Bayonne Refinery; *The Jersey Journal*, Aug. 12, 1946.

40. SONJ, morgued contracts, leases, & agreements, contract between Frasch and Jersey Standard, dated Aug. 2, 1899; Consol. Accts., Bayonne Refinery accounts, analyses of manufacturing business, 1900-1903; Bayonne Appropriation Recs.

41. Bayonne Appropriation Recs., Mar. 31, 1904. The account was closed on Aug. 1, 1904, with an expenditure of $3,421.37.

42. The patents granted to Frasch were Nos. 845,456, 845,735, 951,272, 951,729, and 968,760; those to Robinson were Nos. 910,584, 968,692, 1,014,520, 1,018,374, and 1,057,395; and those to Eggleston were Nos. 908,400 and 1,018,040.

43. SONJ, George McKnight to C. O. Swain, Mar. 15, 1918.

44. U. S. Patent Recs.; "Chemical Engineering Progress in Petroleum Refining," *Chemical and Metallurgical Engineering*, XXXIV, No. 4 (Apr., 1927), 238-241.

45. *Ibid.*

46. E. N. Klemgard, *Lubricating Greases: Their Manufacture and Use* (New York, 1937), *passim;* Bacon and Hamor, *op. cit., passim;* A. W. Nash, "The Development of Petroleum Refining," *Journal of*

the Institute of Petroleum, XXVI, No. 196 (Feb., 1940), 41-56.

47. SONJ, Patent Recs.; Gifford-Eggleston correspondence, 1909-1911.

48. Elliott Recs., Apr. 22-Oct. 29, 1910, *passim*.

49. "Presentation of the Perkin Medal to Mr. Herman Frasch," *The Journal of the Society of the Chemical Industry*, XXXI, No. 4 (Feb. 29, 1912), 171; SONJ, Bergenport Chemical Papers. The contract was made on Nov. 9, 1903. In addition to operating under the license, Standard Oil units had to pay Schoellkopf, Hartford & Hanna Co. of Buffalo for the use of its patterns to make castings for the process.

50. For the average yields of different categories of products from various crude oils, see *Mineral Resources, 1910*, 35. Any given plant inside or outside Standard Oil would show wide variations from the averages. From sour Lima-Indiana petroleum in 1899 the Bayonne Refinery extracted 58.98 per cent in volume of kerosene, while in 1911 its comparable return from the Sour Western category was only 39.72. In 1899, at the same refinery, Pennsylvania crudes yielded 73.65 per cent illuminating oil and Sweet Western yielded 41.17 per cent twelve years later.

51. The discussion of products is based upon inventories found in SONJ, inventories of various manufacturing companies; Bayonne Cost & Yield Statements; memorandum apparently compiled in 1909, dealing with products manufactured by Jersey Standard and its affiliates; Record of Sealed Instruments and morgued leases, contracts, and agreements, contracts with The Liebig Manufacturing Co. and The American Agricultural Chemical Co., 1899-1910; Elliott Recs., J. W. Van Dyke to Elliott, Dec. 12, 1904, and Elliott to Van Dyke, Dec. 20, 1904.

52. "Chemical Engineering Progress in Petroleum Refining," *Chemical and Metallurgical Engineering*, XXXIV, No. 4 (Apr., 1927), 240; *Oil, Paint & Drug Reporter*, LXXVIII, No. 19 (Nov. 7, 1910), 7; *The Petroleum Review*, XXV, No. 516 (Nov. 18, 1911), 332.

CHAPTER 15

1. Information on the members of the Domestic Trade Committee came from SONJ, Salary Recs.; short biographical material on directors; *Nat. Cyc. of Am. Biog.*; Crum and Dungan, *Romance of American Petroleum and Gas; 75 Years of Pet. Ind.*; obituary notices in *The Lamp* and in various newspapers.

Other men on the Domestic Trade Committee at one time or another during the years from 1899 to 1911 were H. G. Westcott, W. P. Cutler, C. W. Owston, R. H. McNall, E. C. Halsey, and probably others not divulged in extant records.

2. Analysis of relations between the Standard Oil group and the Waters-Pierce Oil Co. is derived from testimony and decisions in *U.S.* v. *SONJ; Texas* v. *Waters-Pierce Oil Co.* (1896-1900); *Texas* v. *Waters-Pierce Oil Co.* (1906-1909); *Missouri* v. *Standard Oil Co. (Ind.), Republic Oil Co., and Waters-Pierce Oil Co.; Arkansas* v. *Waters-Pierce Oil Co.; Territory of Oklahoma* v. *Waters-Pierce Oil Co.;* and *Missouri* v. *Johnson.*

3. Rockefeller Recs., J. D. Archbold to J. D. Rockefeller, July 8, 12, 1889; W. H. Tilford to Rockefeller, June 3, 5, 1890.

4. R. H. McNall handled Waters-Pierce correspondence in Tilford's office.

5. *Missouri* v. *Johnson*, Testimony, 489, 552, 555.

The second ouster of Waters-Pierce from Texas occurred in 1907 and was later upheld by the Supreme Court of the United States in 1909. 212 U. S. 86, 212 U. S. 112.

6. J. F. Dewhurst and Associates, *America's Needs and Resources* (New York, 1947), 590.

7. I. R. Barnes, *The Economics of Public Utility Regulation* (N. Y., 1942), 26-35.

As late as 1934 industrial users consumed more than 78% of the natural gas produced in the United States. From the inception of the industry the main categories of industrial consumers—oil producers, lampblack manufacturers, petroleum refineries, and other manufacturing establishments—had utilized an over-

whelming proportion of available natural gas.

Acetylene gas from the application of water to calcium was developed in the 1890's. First practically outlawed by the N. Y. Board of Fire Underwriters because of several explosions, by 1899 acetylene gas had become a commercial product of importance for lighting and welding purposes. (*New York Times*, Mar. 20, 1896; *New York Sun*, Nov. 12, 1899.)

8. Elliott Recs., J. C. Sibley to Elliott, Feb. 16, 1904; *The Petroleum Review*, XII, No. 309 (Feb. 4, 1905), 87; XIX, No. 433 (Sept. 12, 1908), 158; XXI, No. 464 (Nov. 20, 1909), 294; XXV, No. 513 (Oct. 7, 1911), 221; U.S. Cong., Sen. Committee on Finance, *Comparison of Customs, Tariff Laws, 1789 to 1909, Inclusive, and intermediate legislation thereon with statistical tables of imports and other tariff data.* Part I, *1883 to 1909, Inclusive, Text of Laws* (Washington, 1911), 325; *Mineral Resources, 1910*, 102; *1911*, 112.

Sibley, the inventor of Galena-Signal's famous signal oils, wrote as a member of the Committee on Manufactures of the House of Representatives. In answer to requests for information he had ascertained that in 1904 customs officials had assessed a duty of 5.47 cents per gallon on imported gasoline, which he thought sufficiently high to discourage further imports from foreign countries.

Small amounts of asphalt were imported into the United States from Trinidad throughout the early years of the century.

9. Joseph W. Thompson, *Petroleum Laws of All America*, U. S. Bureau of Mines, Bulletin 206 (Washington, D.C., 1921), *passim*.

10. Automobile Manufacturers Assn., *Automobile Facts and Figures* (Detroit, 1949), 17; see Table 41 in this volume.

11. *Missouri* v. *Johnson*, Testimony of R. C. Veit, 1209.

Within the Standard Oil combination many of the marketers obtained their supplies from the refineries by requisition instead of by contracts. Managers in the field forwarded orders to their own sales agents at 26 Broadway, and those men made arrangements for delivery with representatives of the refineries. At periodic intervals payments were made for the delivered goods. After 1905 Waters-Pierce cleared no orders through 26 Broadway, and by 1911 California Standard marketers undoubtedly ordered their supplies directly from Point Richmond and El Segundo, though full statistical data were reported to the central office.

12. Socony Recs., "Receipts of Purchased Oil—from T. W. O. Co.—years 1906, 1907, 1908, 1909, and 1910" and "Total Receipts of Purchased Oil—W. P. O. Co. excluded—years 1906, 1907, 1908, 1909, and 1910." "W. P. O. Co." is the Waters-Pierce Oil Co.

Purchases of gas oil by Standard Oil from outsiders exceeded those of naphtha and gasoline, but deliveries of fuel oil were smaller.

13. SONJ, balance sheets, trial balances, and inventories of various companies, 1899-1911; Consol. Accts., classified earnings, 1899-1911.

14. When the Eclipse Works at Franklin sought to send 400,000 barrels of refined oil per year through pipes to Buffalo, the memorandum of request received the penciled notation: "no lines to spare to pump rfd. oil to Buffalo." (O'Day Recs., 1903-1905, undated memorandum.)

15. *U.S.* v. *SONJ*, XVIII, 274 (Def. Exh. 108); XIV, 1599, Testimony of H. E. Felton; *Ind. Comm.*, I, 778-779, Testimony of Howard Page; SONJ, legal papers giving vote at Union Tank Line stockholders' meeting, July 13, 1908; Consol. Accts., 1891-1911, and accounts of U. T. L. Co.; *Missouri* v. *Johnson*, Testimony of W. M. Hutchinson, H. R. Payne, and H. E. Felton, 751-758, 1162-1164, 1424-1427, 2188-2189, 2202-2216.

The Union Tank Line occasionally furnished cars to outside companies in the West, for carrying crude oil and for moving whale oil from the Pacific Coast eastward.

Rates for use of tank cars, almost exclusively rented to Standard Oil companies, remained steadily at 50, 67, and 83 cents per day, according to capacity, and no charge was ever made for loading prior to Apr. 1, 1911. Inspectors and car tracers of the U.T.L. expedited the movement and effective distribution of

cars, but an expansion of the staff increased costs, as did upkeep. In spite of continuous replacement of old cars by the improved all-steel type patented by J. W. Van Dyke in 1900, repairs were an ever-present problem, a task carried out in part by the U.T.L. itself and partly by lessees at cost plus a small profit. Changing rules and regulations by railroad companies, the Master Car Builders' Association, the Interstate Commerce Commission, and the Bureau of Explosives necessitated many modifications in construction and the addition of safety appliances.

16. Generalizations in this paragraph are based upon examinations of the Dodd Recs., Elliott Recs., the *Report of the Commissioner of Corporations on the Transportation of Petroleum* (Washington, D.C., 1906), *Ind. Comm.*, I, *U.S.* v. *SONJ* (Testimony and Exhibits), and other suits in which Standard Oil companies were involved.

17. Information on Canadian developments from J. S. Ewing; testimony and decisions, *U.S.* v. *Standard Oil Co. (Ind.)*; 148 Fed. Rep. 719; 155 Fed. Rep. 305; 164 Fed. Rep. 376; 170 Fed. Rep. 988; 153 Fed. Rep. 598; 153 Fed. Rep. 625; 153 Fed. Rep. 630; 158 Fed. Rep. 536; 179 Fed. Rep. 614; 218 U.S. 681.

18. *U.S.* v. *SONJ*, XIV, 1593, and XVIII, 272-273.

19. *Standard Oil Co. (Ind.)* v. *United States*, Reply of Plaintiff in Error to Petition of Defendant in Error for Rehearing, 49.

20. *Oil, Paint & Drug Reporter*, LXVII, No. 3 (Jan. 17, 1910), 9; SONJ, morgued leases, contracts, and agreements and Record of Sealed Instruments, 1899-1911, especially contracts for annual sale of 1,000,000 to 2,000,000 gallons of gas oil to the city of Richmond, Va., July 8, 1904, May 1, 1905, Aug. 17, 1906, Aug. 21, 1907; Socony Recs., contracts of New York Standard with the Laclede Gas Light Co. of St. Louis, Dec. 1, 1904, and with the Boston Consolidated Gas Co., Oct. 21, 1908. Under the latter contract the gas company agreed to buy all the gas oil it needed for a period of 4 years from Apr. 28, 1909, the price to be 2.75 cents per gallon for the first 35,000,000 gallons delivered and 2.875 cents for all or part of the next 10,000,000 gallons.

21. Interview of Muriel E. Hidy with L. E. Ulrope, Dec. 6, 1949; *U.S.* v. *SONJ*, XIX, 664-665, 687.

The extensive bulk facilities long maintained at Communipaw (Jersey City) for both foreign and domestic trade were reduced after 1898. Properties of the original operating unit, the National Storage Co., were sold in 1899, partly to the Lehigh Valley Railroad Co. and partly to a new Standard Oil corporation, the New Jersey Storage Co. The last-named company operated tidewater terminals, wharves, and warehouses on Black Tom Island and Constable Hook until 1906, when Jersey Standard took over the properties. (SONJ, morgued leases, contracts, and agreements, Jersey Standard with National Storage Co., Dec. 7, 1899; Lehigh Valley Railroad Co. with Central Trust Co., Dec. 18, 1899; Corp. Recs. of New Jersey Storage Co., chartered Nov. 15, 1899, with a capital of $300,000.)

22. Manual entitled: *Distribution of Expenses in Connection with the B. and M. Report and other Rules in relation to Home Office Accounting* (n.p., 4th edition, 1904).

23. SONJ, Record of Sealed Instruments, Aug. 23, 1906; Williams Recs., Williams to Cleveland Foundry Co., Jan. 14, July 25, 1901; Williams to T. C. Bushnell, July 25, 1901; Williams to F. M. Borden & Brother, Sept. 23, 1901; Williams to W. R. King, Nov. 12, 1901; Williams to J. D. Rockefeller, July 23, 1903; Williams to C. M. Pratt, Dec. 18, 1902; Williams to Queen & Co., Philadelphia, Jan. 22, 1904.

As summarized by Williams to Pratt on Dec. 18, 1902, sales for that year to date had been as follows:

	Domestic	*Export*	*Total*
Lamps	245,330	441	245,771
Heaters	90,095	30,627	120,722
Stoves	69,968	20,660	90,628
Ovens	20,295	7,479	27,774
	425,688	59,207	484,895

24. *Missouri* v. *Standard Oil Co. (Ind.), Waters-Pierce Oil Co., and Republic Oil*

Co., Testimony, H. C. Pierce, 1610, and J. A. Moffett, 2453.

25. SONJ, accounts and papers of various companies, 1899-1911; Salary Recs.; *New York Times*, Nov. 29, 1907; *The Petroleum Review*, XI, No. 291 (Oct. 1, 1904), 272; *Oil, Paint & Drug Reporter*, *passim* (for the nature of the advertisements).

26. Interviews of authors with annuitants and former tank-wagon drivers; *The Lamp*, XV, No. 4 (Dec., 1932), 3.

27. *U.S.* v. *SONJ*, XVI, 2599.

28. T. J. Williams, "The Problems of Marketing," *The Lamp*, I, No. 3 (Sept., 1918), 21; Export Trades Recs., W. Donald to DAPG, May 21, 1906; Socony Recs., annual statistical report for 1906, 68.

By not charging for the container the Standard Oil marketer imposed at least a moral obligation on the retailer to buy only products of the combination, even without a contract to that effect. No examples of such limiting agreements have been found for the United States. At one time Standard Oil units had lent some tanks to retail stores, but, after being held responsible for damage by fire at some undetermined date before 1906, executives decided to abandon the practice. They did sell some tanks, at low prices.

29. Data on Imperial Oil were furnished by John S. Ewing; SONJ, accounts of Waters-Pierce Oil Co., 1899-1904; Salary Recs.; Transcontinental Oil Co. files, John Worthington to J. A. Moffett, Oct. 25, 1909, and report on various producing companies in Mexico by A. F. Corwin and Worthington, Sept., 1911; Huasteca Petroleum Co., Minute Bk., Oct. 10, 1910, Jan. 24, 1911; *Mexican Herald*, 1908-1911, *passim; U.S. Consular Reports*, 1901-1911, *passim; Mineral Resources, 1908-1911*, *passim; The Petroleum Review*, 1908-1911, *passim; Oil & Gas Journal*, Apr. 6, 1911.

John Worthington investigated Mexican producing areas for Jersey Standard in 1908 and three years later he and A. F. Corwin made a comprehensive report on the activities of all the leading producers in Mexico.

30. *The Gilbarco Story;* The Standard Oil Co. (Ohio), *75th Anniversary*, 26; Babcock, *The First Fifty*, 15; data on Imperial Oil furnished by John S. Ewing.

Standard Oil began delivering to farmers in 1910.

31. Data on can-peddling were derived from Export Trade Recs., W. R. King to W. C. Teagle, Sept. 2, 1904; R. Dreyer to King, Jan. 20, 1905; Horstmann to W. Donald, Mar. 16, 1905; R. Dreyer to DAPG, Nov. 5, 1907, Dec. 1, 1909; W. Donald to DAPG, Oct. 31, 1906, Dec. 7, 1907; W. E. Bemis to H. Riedemann, June 23, Dec. 28, 1908; Bemis to DAPG, Mar. 16, May 24, June 22, 1909, Mar. 14, July 25, Sept. 28, 1911; Taylor, "History of the Standard Oil Co.," 217; *U.S.* v. *SONJ*, II, 206, and III, 1508; SONJ, morgued leases, contracts, and agreements, agreement between John Regier, Trenton, and James Donald, Sept. 28, 1902; interview of Henrietta M. Larson with S. C. Gilthorpe, Mar. 22, 1945; New York *Evening Sun*, Jan. 10, 1908.

Gilthorpe said that base bay of peddlers in New Orleans was $10 per week, and that some peddlers made, with commissions, as much as $400 per month during the winter season from December to February. In the East drivers were guaranteed a salary of $11 or $12 per week, plus commissions of 1 or 1¼ cents on each gallon sold, 5 cents for each lamp, and 10 cents for each heater.

32. Data for the following paragraphs on Standard Oil's "unfair" marketing practices were derived chiefly from the *Standard Oil Trust Cases, Ohio,, 1899*; *Ind. Comm.*, I; *U.S.* v. *SONJ*; and Tarbell, *History of the Standard Oil Company*, especially II, chap. x.

Among the miscellaneous accusations against Standard Oil men were giving away oil, following competitors' tank wagons, misrepresenting competitors and their wares, fraudulent testing and measuring of competitors' oil, contaminating competitors' oil, and selling different brands of oil out of the same tank. Many statements in this miscellaneous group were denied in the dissolution suit and not proven, while others were well substantiated and were never denied. Even when the denials and the proven

assertions are evaluated as a whole, however, they appear to be so widely dispersed in geography and in time as to reflect no general policy on the part of management.

33. *U.S.* v. *SONJ*, II, 820-889, 953-959; III, 1009-1010, 1211-1222, 1255-1259; IV, 1923-1929, 1940-1944, 1952-1962; V, 2221-2251, 2347-2353; VI, 3031-3033; X, 1782-1798; and XIII, 1088-1089, 1093, 1515-1518; *Tennessee* v. *Standard Oil Co.* (*Ky.*), 120 Tenn. 86 and 217 U. S. 413.

Ida Tarbell asserted in II, 40, that in 1903 a batch of documents "of unquestionable authenticity" came into her possession and bore out all that competitors had charged about Standard Oil relations with railroads—showing that the office involved received at that time, "at least from the railroads and steamship lines represented [in the papers], information of all oil shipped." Unfortunately, those documents were never published and are not now available. Her description of them indicates that they were similar to a batch stolen by a former employee of Jersey Standard at Baltimore and brought into the dissolution suit. Some of the information thus presented was on stationery bearing the letterhead of a railroad company, and the data indicated a careful checking by Standard men of competitors' shipments of oil. Witnesses asserted that such comprehensive information could be acquired only from railway manifests.

On the other hand, L. J. Drake asserted that never in his experience of selling oil since the 1870's had he had recourse to the purchase of information.

34. *SONJ*, accounts of Republic Oil Co.; morgued leases, contracts, and agreements, three contracts dated May 23, 1901, for purchase of Scofield, Shurmer & Teagle, Cleveland Refining Co., and Scio Refining Co.; *Missouri* v. *Standard Oil Co.* (*Ind.*), *Waters-Pierce Oil Co., and Republic Oil Co.*, Testimony of G. J. Steigerwald, H. C. Hardcastle, C. W. Scofield, L. H. Turrell, C. L. Nichols, and W. C. Teagle; Taylor, *op. cit.*, 255-256.

35. Export Trade Recs., W. Donald to DAPG, May 18, 1906.

36. *Ibid.*, Roe to J. W. Copmann and others, May 2, 1902.

37. *U.S.* v. *SONJ*, III, 1459-1460.

38. Dow and O'Hara, *The National Petroleum Association*, 39-40; Elliott Recs., H. S. Morton to Martin Carey, Apr. 9, 1907; F. T. Thompson to A. D. Eddy, June 8, 1907; Eddy to Carey, June 11, 1907.

39. Socony Recs., H. M. Tilford to F. Q. Barstow, May 11, 1906, enclosing memoranda and lists of names under which competitors were operating at the time. Lists covered hidden companies wholly or partially owned by Valvoline Oil Co., Red "C" Oil Manufacturing Co., Inc., The Columbia Oil Co., Crown Oil & Wax Co., The Pure Oil Co., Ltd., National Refining Co., Cornplanter Refining Co., Warren Refining Co., Crew-Levick Co., Canfield Oil Co., and others.

40. *U.S.* v. *SONJ*, V, 2133-2135.

41. Export Trade Recs., Bemis to DAPG, May 24, 1909, May 13, 1910; *U.S.* v. *SONJ*, XIII, 1523-1525 (F. B. Squire).

42. *Mineral Resources, 1911*, 19; Socony Recs., annual statistical report for 1906, 65. In 1906 refinery deliveries of gas oil to home trade by Standard Oil marketers amounted to 6,500,406 barrels of 50 gallons.

43. SONJ, Consol. Accts., 1900-1911, classified earnings.

CHAPTER 16

1. SONJ, Salary Bks. and cards; short biographical material on directors; interview of J. S. Ewing with G. Harrison Smith, Nov. 25, 1948.

Paine's obituary notice in *New York Times*, Apr. 12, 1921, states that he retired in 1909, but his salary record terminated in 1907.

2. *Ind. Comm.*, I, 628.

3. Socony Recs., agreement between John E. Borne, C. Howard Scrymser, and Charles L. Tappin on the one hand and W. H. Tilford on the other, Mar. 13, 1893; SONJ, Corp. Rec. and Certificate Bk. of Argand Refining Co.; accts. of Borne, Scrymser Co., 1893-1911; Taylor, "History of the Standard Oil Co.," 243;

Oil, Paint & Drug Reporter, L (Dec. 21, 1896), 7 and LI (Mar. 8, 1897), 13. Scrymser died in 1897.

4. Socony Recs., agreement between Grant McCargo and Standard Oil Co. of New York, May 17, 1895; SONJ, old formulae book and Minute Book of Pa. Lubricating Co.; *History of Pittsburgh Works* (n.p., n.d.).

Several small Pennsylvania specialty works, processing petrolatum and similar products, were purchased prior to 1904, and even at that date some field men were of the opinion that it might be advisable to eliminate still others.

5. Bayonne Appropriation Bk. and cards, 1892-1911; "History of Eagle Works," manuscript dated 1939; Socony Recs., Vacuum Oil Co., Secretary's Record, 1902-1911.

The new filter pressing plant and sweaters were installed at Bayonne during the years from 1892 to 1894 at a cost of $101,000.

6. Cassidy, "Memories of Yesteryears."

7. Bayonne Appropriation Bk. and cards, 1896-1899; comments of Boverton Redwood upon Andrew Campbell's article entitled "Petroleum Refining," in *The Journal of the Institute of Petroleum Technologists,* II (1916), 274-302; *Paint, Oil & Drug Review,* Jan. 8, 1896, June 30, 1897; "History of Eagle Works."

The clay was ground fine, added to hot oil, agitated, and then passed through a filter press, the earth and coloring impurities being left behind.

8. SONJ, Bayonne Appropriation Bk. and cards, 1908-1911; Cassidy, "Memories of Yesteryears"; Baltimore Refinery, "Information compiled for the Board of Directors Standard Oil Company of New Jersey upon the occasion of their Inspection Visit, Wednesday, December 6, 1944."

9. SONJ, accts. and papers of various lubricating oil works and companies, 1911; *A History of the Swan-Finch Oil Corporation* (n.p., *ca.* 1943); Pennsylvania Lubricating Co., old formula book, 1906.

10. The foregoing generalizations on the independence of lubricating managers are based largely on testimony in *U.S.* v. *SONJ* and correspondence in Elliott Recs. The factual material on positions of the men came from SONJ, Salary Bks. and cards; Socony Recs., Vacuum Oil Co., Secretary's Record, 1902-1911; *A History of the Swan-Finch Oil Corporation.*

11. Interviews by R. W. Hidy with former employees of Pennsylvania Lubricating; old formula book, which includes greases named for specific steel companies.

12. SONJ, Consol. Accts. of S. O. Interests, 1892-1899, and of SONJ, 1899-1911.

13. SONJ, West Virginia Oil Co. Records, especially Letter Book, C. H. Shattuck to A. P. Gorman, Sept. 6, 1905, Minute Book, and Journal; morgued contract between SONJ and West Virginia Oil, June 5, 1894; Salary Bks. B and C; accts. of West Virginia Oil, Inland, Galena, Signal, and Vacuum, 1892-1899; Socony Recs., contract between New York Standard and Signal, Feb. 23, 1894; *U.S.* v. *SONJ,* I, 436-437, and II, 503-504; *Ind. Comm.,* I, 757-758; New York *Commercial Advertiser,* Apr. 8, 1898.

Thereafter the West Virginia Oil Co. confined its operations to small sales of natural lubricating oils, to collecting and transporting oil extracted by lessees of its producing lands, and to running the Wells Refinery, which was closed in 1896.

The investment of Galena in S. T. Baker Oil Co. was carried on the books at $6,292.

14. SONJ, accts. of T. & B. Dept., 1892-1911, especially letter of E. B. Hough to E. T. Bedford, Jan. 13, 1896. Outstanding amounts on foreign consignment account on Dec. 31, 1895, totaled $653,537. The Buenos Aires company was organized in Dec., 1894, and liquidated two years later.

15. SONJ, Salary Bks. and cards; accts. of Vacuum Oil Co., 1892-1911; *The Petroleum Times,* LIII, No. 1353 (June 17, 1949), 546-547; Elliott Recs., Folger to Elliott, Jan. 19, 1906; Dodd Recs., Dodd to Folger, Apr. 13, 1903; *U.S.* v. *SONJ,* I, 414-415; VII, 235-335; *Waters-Pierce Oil Co.* v. *Texas* (Testimony of Stephen Johnson), 548-555.

16. *Oil, Paint & Drug Reporter,* June 20, 1898.

17. SONJ, Consol. Accts. of S. O. Interests, 1895.

18. *Oil, Paint & Drug Reporter,* July 11, 1898; Elliott Recs., S. H. Paine to Elliott, July 12, 1906; Elliott to Paine, July 13, 1906; H. J. Bettendorf, *Paperboard and Paperboard Containers* (Chicago, 1946), 57.

About 1905, E. H. Vavra of Cicero, Illinois, discovered and soon patented the "cold waxing" process for coating paper cartons now so widely used.

19. *U.S.* v. *SONJ,* XVII, 3256.

20. SONJ, agreement between Galena-Signal, Pa., and Galena-Signal, Paris, 1909; Export Trade Recs., Howard Page to T. C. Bushnell, May 22, 1900 (quotation) and Page to S. A. Megeath, May 26, 1900; *Pittsburgh Dispatch,* Aug. 10, 1904.

21. *The Petroleum Review,* XVII (Aug. 17, 1907), 151.

This article reports the Vacuum Oil Co. in Russia as owning a refinery at Muhlgraben, near Riga.

Most of the information on the foreign operations of Vacuum Oil was derived from SONJ, Corp. Recs. and Export Trade Recs.

22. SONJ, Export Trade Recs., C. M. Everest to W. Donald, Feb. 15, 1905; Osgood & Davis to Vacuum Oil Co., Aug. 31, 1908, Jan. 23, Mar. 11, 1909.

23. SONJ, Salary Bk. B and cards; Export Trade Recs., Teagle to W. Donald, July 18, Aug. 5, 1904; Donald to Teagle, Aug. 4, 24, 1904; Deutsch Vacuum Oil Co. to C. E. Bedford, Mar. 8, 1911.

24. "Another Lesson from America," *The Petroleum Review,* XIII, No. 337 (Aug. 19, 1905), 147-148; XXI, No. 464 (Nov. 20, 1909), 291.

25. Elliott Recs., F. H. Bedford to M. F. Elliott, July 26, 1907; Elliott to Asche, Feb. 15, 1911; Piesse & Sons to Elliott, Dec. 8, 1911; Piesse & Sons to Teagle, Jan. 18, 1913.

26. Export Trade Recs., DAPG to Standard Oil Co. of New York, Jan. 4, 1906; H. Riedemann to Bemis, July 14, 1910, Oct. 28, 1911; Bemis to F. H. Bedford, Dec. 28, 1909; Bemis to DAPG, Nov. 30, 1910, Nov. 13, 1911; Bedford to DAPG, Dec. 11, 1905; Bedford to W. Donald, Feb. 26, 1906; W. Donald to DAPG, Dec. 19, 1904, June 22, 1905, Apr. 28, May 11, June 1, June 14, 1906; H. Riedemann to W. Donald, July 8, Nov. 21, 1905, Jan. 25, 1906, Jan. 29, 1907; H. Riedemann to Teagle, Dec.. 21, 1911; Teagle to DAPG, Dec. 7, 1911; SONJ, DAPG, trial balances, 1906-1911.

Oppenheim's commission had been 4 per cent on lubricants and 2½ per cent on wax. Because of the tax situation DAPG operated on its own account.

27. SONJ, papers and accounts of Bedford et Cie, including "Débiteurs Divers, 1895"; E. B. Hough to S. Burnet, Apr. 8, 1893; S. Burnet to Hough, Apr. 10, 1895; Hough to L. D. Clarke, May 13, 1895; Hough to J. G. Macgowan, May 11, 12, 13, 1895; Export Trade Recs., G. F. Southard to T. C. Bushnell, Dec. 29, 1896, Feb. 26, 1900.

28. SONJ, Consol. Accts. of S. O. Interests, 1893; *Oil, Paint & Drug Reporter,* 1892-1899, *passim,* especially XLI (Feb. 7, 1892), 7; XLII (Oct. 3, 1892), 9, and (Oct. 31, 1892), 7.

In 1895, of 95,000,000 pounds of wax exported, 70,000,000 went to the United Kingdom.

29. Gerretson, *Koninklijke,* III, 321-322.

30. SONJ, collection of predissolution data; Socony Recs., annual statistical report for 1906; *U.S.* v. *SONJ,* VIII, 1002-1010.

31. Elliott Recs., Bedford to Elliott, Feb. 25, 1907.

CHAPTER 17

1. Much of the material for this chapter comes from a study of the voluminous correspondence in the Export Trade Recs. and Archbold Recs.

2. *U.S.* v. *SONJ,* I, 91 (C. M. Pratt), 139 (W. H. Tilford), II, 808-809 (R. H. McNall); Export Trade Recs., letters by G. H. Smith to correspondents, May 11, 1911; interview of N. S. B. Gras with Walter C. Teagle, Nov. 26, 1948; interview of J. S. Ewing with G. Harrison Smith, Dec. 23, 1948.

T. C. Bushnell died in 1902; C. F. Ackermann retired in 1903. Howard Page and James Donald, brother of William Donald and Jersey Standard's agent for sales of kerosene and gasoline, both served on the committee. G. Harrison Smith was secretary at the end of the period. W. E. Bemis took William Donald's place in following developments in Germany and kept informed on Brazil; Walter McGee took over correspondence with Australian representatives, and McNall was responsible for relations with marketers in South Africa by 1911.

3. Export Trade Recs., F. D. Asche to Pratt, Feb. 18, 1904.

4. *Ibid.*, James McDonald to Asche, Nov. 3, 1903.

5. Archbold Recs., excerpt letter of J. W. Copmann, Feb. 22, 1900; Elliott Recs., Elliott to Archbold, Jan. 11, 1901; agreement of Standard Oil Co. of New York with J. H. Fertig, J. F. Lowder, Edwin Dun, J. W. Copmann, and K. Erichiro; Socony Recs., New York Standard Minute Bk.; Taylor, "History of the Standard Oil Co.," 295; *The Journal of the Society of the Chemical Industry*, XXI (Oct. 15, 1902), 1228, citing A. Ragosine, "Japanese Petroleum Industry in 1902," *Petroleum Ind. and Tech. Rev.*, 1902; *The Petroleum Review,* XI, No. 285 (Aug. 20, 1904), 141; E. J. Sadler, "Producing Oil," *The Lamp,* IV, No. 5 (Feb., 1922), 20.

The Petroleum Review quotes from a report by Meraboff to the Baku Naphtha Association, which says that Marcus Samuel & Co. and several Japanese interests were at first investors with Standard Oil in this enterprise.

6. *U.S. Daily Consular and Trade Reports,* No. 130 (June 5, 1911), 1011-1012.

7. Archbold Recs., W. E. Bemis to F. Q. Barstow, Sept. 7, 1905, and other papers on Formosa; F. G. Keiller to Barstow, Oct. 12, 1905; Howard Page to Barstow, Oct. 21, 1905; *Mineral Resources, 1909,* 110.

Standard Oil investigated the possibilities of production in Formosa but reports were discouraging.

8. Archbold Recs., W. M. Weller, Burma, to Barstow, July 13, 1903, and 18-page report; *Mineral Resources, 1886,* 474-480; Boverton Redwood, "The Oil-Fields of India: Notes on the Petroleum Deposits of Burma, Assam, the Punjab, and Baluchistan," *The Journal of the Society of the Chemical Industry,* IX (Apr. 30, 1890), 359-370, especially 365.

The Rangoon Oil Co., Ltd., which by erecting a refinery at Rangoon in 1870 adopted "the principle of manufacturing the commercial products at a port of shipment," was liquidated in 1876. Then Finlay, Fleming & Co., merchants, carried on in the industry for ten years until Burmah Oil Co., Ltd., was formed; it built two refineries at Dunniedaw and Syriam near Rangoon.

9. Archbold Recs., cable, Acme to Major Comfort, Jan. 17, 1902.

10. The material for the following pages comes largely from the Archbold Recs. In addition to copies of the cables which passed between Standard Oil Co. and its representatives in India and Burma, there are reports from the men, a summary memorandum addressed by Barstow to Archbold, miscellaneous letters, and excerpts from others.

11. Archbold Recs., copy of cables, Acme to Comfort, May 15, 22, 1902.

12. Dodd Recs., S. C. T. Dodd to Archbold, June 9, 1903; Archbold Recs., copy, Lord Lansdowne to Henry White, Dec. 16, 1902; W. Parsons, secretary, Bengal Chamber of Commerce, to Libby, Nov. 11, 1902 (printed).

13. Archbold Recs., memo on the Rangoon Oil Co., Ltd., Barstow to Archbold, n.d.; John Bushnell to Archbold, Aug. 5, 1902; unsigned memo, Sept. 16, 1902.

14. Archbold Recs., W. H. Libby to His Honour Sir Hugh Barnes, Lieutenant Governor of Burma, July 1, 1903 (quotation); Libby to Barstow, July 2, 1903, newspaper clippings; W. M. Weller to Barstow, July 13, Mar. 30, 1903; Alex Forbes to W. W. Oswald, Jan. 7, 1904.

15. Archbold Recs., memo, unsigned, undated (1905); W. W. Oswald to Barstow, May 25, 1905; Libby to Barstow, Nov. 13, 1905; copy of W. Rockefeller to Whitelaw Reid, Nov. 6, 1905; Bemis to Barstow, June 26, 1905.

16. *The Petroleum Review*, XIII, No. 333 (July 22, 1905), 61-62.

17. Archbold Recs., reports of Fertig, 1899; reports of John C. Machale, 1900; semiannual reports on the production in the Far East; C. F. Ackermann to Archbold, 1900-1903; McDonald to Asche, June 14, 1904; Bemis to Barstow, Nov. 13, 1905; reports of Fred G. Keiller, 1905; *Mineral Resources, 1909,* 409.

Production of the Dutch East Indies rose from 2,250,000 barrels in 1900 to more than 10,000,000 barrels in 1908.

18. Archbold Recs., W. C. Knoops to Lufkin, Oct. 9, 1905; Libby to Barstow, Nov. 13, 1905.

19. *Ibid.*, Howard Page to Barstow, Oct. 20, 1905; Gerretson, *Koninklijke*, II, 288-289, 448, 450, 480-485, 489, and 500.

20. Elliott Recs., Teagle to Elliott, Oct. 15, 1910, Jan. 6, 1911, Jan. 15, 1912; Teagle to W. T. Klaare and F. Horstmann, Oct. 14, 1910; correspondence between Teagle and directors of American Petroleum Co., Aug. to Dec., 1910, *passim*; Teagle to A. C. Bedford, June 9, 1911.

21. Export Trade Recs., Livingston Roe, Jr., to McDonald, Mar. 26, 1903; Asche to McDonald, Apr. 6, 1903.

22. *Ibid.*, August von Hartz to Walter McGee, Aug. 10, 1904, Oct. 10, 1906.

In 1906 von Hartz complained to McGee that Italo-Americana was finding it difficult to meet the price of French competitors selling Romanian gasoline in North Africa. On the other hand, the American refiners expressed objections to the low price paid them for export naphtha.

23. Export Trade Recs., Bemis to DAPG, Dec. 12, 1911; Teagle to Asche, Dec. 6, 1903; McGee to Ruprecht, May 4, 1909 (quotation); H. Riedemann to Bemis, Sept. 17, 1908; Teagle to McNall, Apr. 28, 1909; Teagle to C. M. Everest, Dec. 23, 1908.

24. *Ibid.*, Teagle to Asche, Dec. 6, 1903; Donald to Asche, Aug. 31, 1904; Donald (DAPG) to Donald, N. Y., Sept. 24, 1904; Riedemann to Bemis, June 11, 1908; Bachof, "DAPG," *passim*; *The Petroleum Review*, XIX, No. 438 (Nov. 21, 1908), 295; Henry, *Thirty-five Years of Oil Transport*, 35.

In explaining terms to his American associates in 1903, Teagle defined "benzine" as covering all grades of American "finished naphthas." Among the products produced were: light auto benzine, common auto benzine, lamp benzine, washing benzine, heavy benzine, miner's naphtha, painter's naphtha, turpentine oil surrogate.

25. Export Trade Recs., notes on Bremen meeting between directors of DAPG and those of American Petroleum Co., July 12, 1893; F. W. Randebrock to Libby, Apr. 24, 1894; A. Maquinay to Roe, May 4, 1894; Randebrock to Roe, May 18, 1894; copy of naphtha agreement of DAPG, American Petroleum Co., and Korff, July 1, 1894, and Aug. 18, 1894.

26. Export Trade Recs., Asche to McDonald, Dec. 21, 1903; Teagle to McDonald, Dec. 28, 1903.

27. *Ibid.*, Tonio Riedemann to Donald, Nov. 26, 1904; Donald (DAPG) to Donald, N. Y., Oct. 6, 1905; Donald to Asche, Dec. 26, 1903.

28. *Ibid.*, Teagle to McDonald, Dec. 28, 1903; McDonald to Asche, Mar. 31, 1904; Teagle to Donald, July 13, 1904; Asche to Donald, Mar. 9, 1904; G. B. Gifford to H. L. Pratt, July 16, 1904; H. Riedemann to McDonald, Feb. 23, 1904 (quotation).

29. *Ibid.*, Donald to DAPG, July 13, 1904, June 26, 1905; H. Riedemann to Donald, Feb. 23, 1905, Dec. 11, 1906.

30. *Ibid.*, Donald (DAPG) to Donald, N. Y., Sept. 24, 1904.

31. *Ibid.*, Donald to Asche, Aug. 26, 1904 (quotation); Asche to Donald, Oct. 21, 1904; H. Riedemann to Donald, Nov. 15, 1904; Donald to DAPG, May 28, 1906.

32. *Ibid.*, Tonio Riedemann to Donald, Apr. 14, Sept. 4, 1905, June 22, 1906; H. Riedemann to Donald, May 17, 1906.

33. *Ibid.*, H. Riedemann to McDonald, Feb. 23, 1905.

34. *Ibid.*, copy of agreement between Deutsch-Amerikanische Petroleum-Gesellschaft and Vereinigten Benzinfabriken Gesellschaft, Aug. 18, 1906, effective

Sept. 1, 1906, to expire 1910, canceled July 7, 1908.

35. Export Trade Recs., Teagle to Donald, July 13, 1904; G. B. Gifford to H. L. Pratt, July 16, 1904; Donald (DAPG) to Donald, N. Y., Aug. 23, 1904; Tonio Riedemann to Donald, Oct. 4, 27, 1904; H. Riedemann to W. Donald, Mar. 6, 1906, June 2, 1907; H. Riedemann to Bemis, June 6, 1908, Jan. 18, Dec. 3, 1909, Apr. 24, 1911; Vacuum Oil Co. to DAPG, July 21, 1911; memos on refineries from Riedemann, Feb. 9, 1911, May 5, 1911 (quotation), July 12, 1911; Bemis to DAPG, May 16, 1911; Bachof, "DAPG," *passim*.

36. Export Trade Recs., memo, Teagle, 1903; Teagle to Asche, Dec. 6, 1903; Teagle to Donald, July 13, 1904; Asche to McDonald, Jan. 29, 1904; McDonald to Asche, Feb. 10, 1904; G. B. Gifford to H. L. Pratt, July 16, 1904; C. I. Robinson to James Smith, Feb. 20, 1905.

37. *Ibid.*, Teagle to C. M. Everest, Dec. 23, 1908.

38. *Ibid.*, memo, Oct. 21, 1910; H. Riedemann to Bemis, Dec. 28, 1910.

It cost 4 to 10 cents to treat 100 gallons of naphtha in the United States and 31 to 46 cents in Germany.

39. Export Trade Recs., McNall to McGee, May 20, 1909; von Hartz to McGee, Sept. 1, 1909; McGee to Italo-Americana, Sept. 6, 1911; Bemis to DAPG, Dec. 12, 1911.

C. I. Robinson and H. M. Pratt gave special attention to meeting the needs of the European market when treating naphtha.

40. Export Trade Recs., memo, May 5, 1911; Teagle to Bemis, June 3, 1908; Riedemann to Bemis, Jan. 3, Mar. 10, May 12, July 2, 1910; Tonio Riedemann to Teagle, July 1, 1910; Gerretson, *Koninklijke*, III (popular edition), 284, 318-321.

As a result of many arguments about the method by which DAPG billed naphtha products from German refineries to the American Petroleum Co., sales by these companies in Germany were pooled from 1908.

41. Export Trade Recs., Asche to McDonald, Mar. 27, 1903; McDonald to Asche, Apr. 6, 1903; Asche to Pratt, Mar. 22, 1905; Teagle to Anglo-American, Feb. 4, 1907; Teagle to McNall, Apr. 28, 1909; Bemis to Teagle, Sept. 21, 1909; Bemis to DAPG, Nov. 3, 1911; "Adjustment of Asiatic Naphtha Purchase Account, 1905 to 1911."

In 1903 Deterding promised to sell to Standard Oil naphtha not required by his customers. Standard Oil also bought from Shanghai Langkat. The account mentioned gives profits but does not distinguish between suppliers. The years of highest profits, and presumably of purchases, were 1907 and 1908.

42. *U.S. Consular Report*, No. 256 (Jan., 1902), 45-46, No. 285 (June, 1904), 745.

43. Archbold Recs., C. F. Lufkin to Archbold, Feb. 15, 1900.

44. *Ibid.*, C. C. Campbell to T. C. Bushnell, Jan. 27, 1900; Lufkin to Archbold, Feb. 15, 1900 (quotation); and Southard to Archbold, Feb. 15, 1900.

45. *Ibid.*, Lufkin to Archbold, Feb. 15, 1900.

46. The material on the Russian petroleum industry comes largely from Archbold Recs., reports, 1900-1910, *passim*; *U. S. Consular Reports,* especially No. 248 (May, 1901), 2 (quotation); *Engineering*, LXX (Aug. 17, 1900), 217; Thompson, *The Oil Fields of Russia, passim*; *The Petroleum Review,* esp. W. Goulichambaroff, "Petroleum and Its Products in the World's Trade," XIII, No. 332 (July 15, 1905), 44; XIII, No. 337 (Aug. 19, 1905), 149; XIV, No. 365 (Mar. 3, 1906), 165; XX, No. 444 (Feb. 13, 1909), 87-88; and XXII, No. 468 (Jan. 15, 1910), 42; Gerretson, *Koninklijke,* III (popular edition), 146-157.

Dvorkovitz in *The Petroleum Review* gives 1903 instead of 1904 as the year of maximum exports of petroleum products from all Russia and attributes the beginning of the decline of the industry to increased railroad rates from Baku to Batum. While the largest amount of petroleum products went from Baku, there were also exports from Novorossisk, by the Volga River, and by railroads to Eastern Europe and the Baltic Sea, and from Archangel. The statistics usually given are from Baku alone.

47. *The Petroleum Review,* XIII, No. 340 (Sept. 9, 1905), 198; XIII, No. 337 (Aug. 19, 1905), 149-150; and XX, No. 444 (Feb. 13, 1909), 87-88.

48. John H. Snodgrass, "Russia: A Handbook on Commercial and Industrial Conditions," *Special U.S. Consular Reports,* No. 61 (Washington, 1913), 136; *The Petroleum Review,* XXIII, No. 482 (July 30, 1910), 70; *Mineral Resources, 1911,* 129.

After order was restored, Russia's production of oil again rose until 1910 but declined again in 1911.

49. Archbold Recs., John Worthington to Fred Mohr, Jr., Nov. 22, 1910; *The Petroleum Review,* XX, No. 449 (Apr. 24, 1909), 245.

50. Archbold Recs., F. H. Oliphant to "Gentlemen," Jan. 7, 1896; *The Journal of the Society of the Chemical Industry,* XVIII (May 31, 1899), 482, citing R. Zaloziecki, "Review of the Galician Petroleum Industry in 1898," *Petrol. Ind. and Tech. Rev.,* 1899, I, 9-12; *Oil, Paint & Drug Reporter,* Aug. 10, 1896, Jan. 18, June 7, 1897; *New York Journal,* May 7, 1897; *U.S. Consular Report,* No. 200 (May, 1897), 114.

The French, including the Rothschilds, invested in Austria-Hungary. One company hopefully adopted the title of Standard Oil Company of Galicia, Ltd., but it was soon liquidated.

51. Archbold Recs., Barstow to Archbold, Dec. 22, 1902, with extract from Libby's letter; L. Roe, Jr., to J. D. Archbold, n.d., and enclosing F. E. Powell, report of meeting with Russians and Galicians in Berlin, Dec. 3, 4, 1902, dated Dec. 8, 1902; O'Day Recs., copy of Galician oil report, 1903, with excerpts from European papers.

52. Archbold Recs., report of J. E. O'Neill and J. F. Archbold on Alsace-Lorraine and Hanover, Feb., 1903, and on Italy, Mar., 1903; Galician Oil Report, Feb., 1903; C. F. Lufkin to Archbold, July 6, 1903 (quotation); O'Day Recs., Galician oil report, 1903.

53. SONJ, collection of predissolution data; Corp. Recs.; Export Trade Recs., *passim*; *Oil, Paint & Drug Reporter,* LXV, No. 22 (May 30, 1904), 10; *The Petroleum Review,* XI, No. 279 (July 9, 1904), 21.

54. Export Trade Recs., W. Riedemann to Teagle, Feb. 26, 1914, with memo prepared for Ambassador Gerard (hereinafter cited Memo, 1914); *Oil, Paint & Drug Reporter,* LXV, No. 4 (Jan. 25, 1904), 26, and LXIX, No. 13 (Mar. 26, 1906), 54-55; *The Petroleum Review,* XV, No. 381 (Sept. 15, 1906), 155; XVI, No. 401 (June 22, 1907), 337; XVII, No. 402 (July 6, 1907), 19; XIX, No. 434 (Sept. 26, 1908), 181-182, and No. 435 (Oct. 10, 1908), 193-194, 199-200; XX, No. 453 (June 19, 1909), 357-358, 366; *Mineral Resources, 1908,* 93.

Crude oil production in Galicia rose as follows: 5,234,475 barrels in 1903 to 12,612,295 barrels in 1908.

55. Export Trade Recs., Memo, 1914; *Oil, Paint & Drug Reporter,* 1910-1911, *passim,* articles from foreign periodicals.

56. SONJ, misc. letters, including draft of letter, C. M. Everest to Secretary of State, U.S., Oct. 15, 1910, letter, Oct. 20, 1910, and Libby to C. O. Swain, Oct. 19, 1910; Export Trade Recs., Memo, 1914.

57. SONJ, copy, R. C. Kerens, American Ambassador, to Secretary of State, Vienna, Sept. 28, 1910, and copy Mikalovich to Kerens, July 29, 1910; Export Trade Recs., Libby to Teagle, Nov. 22, 1911; Memo, 1914; *Oil, Paint & Drug Reporter,* LXXVIII, No. 23 (Dec. 5, 1910), 28K; *The Petroleum Review,* XXIII, No. 491 (Dec. 3, 1910), 353, and No. 493 (Dec. 31, 1910), 413.

58. *Oil, Paint & Drug Reporter,* L, No. 9 (Aug. 31, 1896), 16; LI, No. 1 (Jan. 4, 1897), 14 (report of the acting Consul-General, A. P. Bennett, to British Foreign Office); LII, No. 20 (Nov. 15, 1897), 17, and No. 23 (Dec. 6, 1897), 47; *U.S. Consular Report,* No. 243 (Dec., 1900), 540; *Mineral Resources, 1896,* 867-868.

59. Archbold Recs., cable, von Gwinner (Deutsche Bank) to Stillman, New York, Nov. 25, 1902.

60. *Ibid.,* memorandum of Managing Director Lagerwall, The Romanian Oil Trust, Ltd., Nov. 25, 1899; compare Gerretson, *Koninklijke,* II, 417-418; *The Petroleum Review,* XI, No. 280 (July 16,

1904), 49-50; *U.S. Consular Report*, No. 278 (Nov., 1903), 564.

61. SONJ, Corp. Recs.; Dodd Recs., S. C. T. Dodd to J. A. Moffett, Feb. 4, 1904; *Oil, Paint & Drug Reporter*, LXVI, No. 5 (Aug. 1, 1904), 38-39.

Early leases were taken in Southard's name.

62. SONJ, Archbold Recs., circular letters to superintendents, n.d.; salary recs.; letters from Fred Mohr, Jr., to Charles T. White, Oct. 11, 1909; letters from H. P. Chamberlain and E. J. Sadler; *The Petroleum Review*, XV, No. 388 (Dec. 22, 1906), 349, and XVI, No. 390 (Jan. 19, 1907), 43.

Sadler's first salary in Romania was $6,000 per year.

63. SONJ, collection of predissolution data; Export Trade Recs., H. C. Folger, Jr., to W. C. Teagle, Sept. 6, 1911; *The Petroleum Review*, XI, No. 284 (Aug. 13, 1904), 134; No. 289 (Sept. 17, 1904), 227; XIII, No. 331 (July 8, 1905), 28; and XIV, No. 357 (Jan. 6, 1905), 5.

64. *The Petroleum Review*, XVI, No. 392 (Feb. 16, 1907), 89-90; No. 393 (Mar. 2, 1907), 117-118.

Dvorkovitz claimed the cartel had kept domestic prices higher in Romania than those for export, and Româno reduced prices to increase consumption.

65. Export Trade Recs., Româno-Americana to W. M. McGee, July 4, 1907, and McGee to Nelson Moody, July 29, 1908; copy of agreement between Niculescu Brothers and Româno-Americana, July 12, 1907, which covered 8 stations and the services of George and Alexandre Niculescu for five years.

66. Dodd Recs., S. C. T. Dodd to Hon. Elihu Root, Nov. 11, 1904. Romania, Serbia, and Greece shared an American representative.

67. SONJ, E. J. Sadler to H. C. Folger, Jr., May 30, 1910.

68. Archbold Recs., government regulations to be complied with by oil producers on private (not state) properties; *U.S. Consular Report*, No. 324 (Sept., 1907), 162-163; *The Petroleum Review*; XXI, No. 456 (July 31, 1909), 67; and XXII, No. 474 (Apr. 9, 1910), 204.

69. SONJ, copy of Romanian law, Apr. 10/23, 1908; *U.S. Daily Consular and Trade Report*, No. 38 (Aug. 17, 1910), 524-525.

70. SONJ, copies of legal documents and letters: agreement between Steaua-Româna and Româno-Americana, Bucharest, May 6/19, 1908; agreement between Româno-Americana and Distribuirea, May 6/19, 1908, and commission contract between these two, June 1, 1908; copy of agreement, Steaua-Româna, Româno-Americana, Aurora, and Astra-Româna, May 1/14, 1910; W. C. Brower to W. M. McGee, Feb. 4, 19, Nov. 2, 1910.

Româno-Americana held 180,000 leis out of the 1,000,000 leis capital in Distribuirea.

In late 1910 the need to ask Distribuirea for permission to export fuel oil was removed as a result of the discussion arising from Româno-Americana's request to export 10,000 tons in the last quarter of that year.

71. Archbold Recs., Lufkin to Archbold, July 6, 1903; Export Trade Recs., Bemis to DAPG, Mar. 15, 1909.

In 1906 Româno-Americana produced 46,999 tons, and in 1909, 132,757 tons, the latter out of a total of about 1,300,000 tons for Romania.

72. Export Trade Recs., *passim*; *The Petroleum Review*, XI, No. 280 (July 16, 1904), 49; XVI, No. 400 (June 8, 1907), 323-324.

Exports of petroleum from Romania increased 83 per cent from 1904 to 1906 and to 581,417 tons in 1910.

73. SONJ, collection of predissolution data.

CHAPTER 18

1. SONJ, Corp. Recs.; salary cards, entries 1902-1908; Archbold Recs., *passim*, especially W. Donald to Barstow, Jan. 4, 1906, and Colonial Oil Co. to W. C. Teagle, Apr. 23, 1907; *Missouri* v. *Johnson*, Testimony, 1131-1140 (Morrell), 1142-1149 (J. W. Fisher); *U.S.* v. *SONJ*, Testimony, II, 814 (R. H. McNall).

2. Material on the Vacuum Oil Co. comes largely from SONJ, Corp. Recs. and Salary Recs.; Export Trade Recs., *passim*;

old export statistics, F. D. Asche, Oct. 28, 1911.

3. Export Trade Recs., copy of contracts between Société Espagnole d'Achats et d'Effretements and Standard Oil Co. of New York, May 1, 1904, and Apr. 30, 1909 (contract in name of John J. Hoff, Bedford Petroleum Co., not Standard Oil Co. of New York); memos and letters, Teagle to Bemis, 1908, *passim*, Hoff to Asche, 1908-1909, *passim*, and Hoff to Teagle, Jan. 17, 1914.

4. Export Trade Recs., especially letters by J. D. Archbold, Livingston Roe, Jr., F. D. Asche, J. McDonald, W. H. Libby, J. J. Hoff, George Lesieur, 1899-1911, *passim*; Libby to Teagle, Dec. 4, 1913; contracts operative Jan. 1, 1900, Jan. 1, 1906, and Jan. 1, 1910; Dodd Recs., S. C. T. Dodd to L. D. Clarke, May 12, 1903.

Early contracts were in the name of Standard Oil Co. of New York, that of 1905 was signed by Anglo-American, while later arrangements were in the name of John J. Hoff.

5. Export Trade Recs., H. C. Folger, Jr., to Asche, Sept. 11, 1903.

In 1902 Standard Oil's price for crude oil (the price for credit balances plus full pipage—75 cents per barrel to New York and 70 cents to Philadelphia—and another 10-cent charge per barrel) totaled 4.928 cents per gallon compared with its quotation of 4.90 cents per gallon of kerosene.

6. Export Trade Recs., Hoff to Asche, Oct. 5, 1905 (quotation); *New York Herald*, Mar. 30, 1903.

There were also heavy local taxes. The octroi in Paris was 20 centimes per liter.

7. Export Trade Recs., Hoff to Asche, July 16, 1903 (quotation).

8. *Oil, Paint & Drug Reporter*, LXXVII, No. 8 (Feb. 21, 1910), 46-47; No. 10 (Mar. 7, 1910), 7; *U.S. Daily Consular and Trade Reports*, No. 103 (Nov. 2, 1910), 435, and No. 243 (Oct. 17, 1911), 277.

The minimum French tariff on crude was equivalent to 5.12 cents per gallon and that for kerosene 7.31 cents. The maximum rates applied from Nov., 1909, through Mar., 1910, were twice as much.

9. The plant at Rouen was converted into a lubricant works.

10. Export Trade Recs., memo, 1914; Socony Recs., annual statistical report for 1906; old export statistics, F. D. Asche, Oct. 28, 1911.

11. Material from interviews contributed to this and the next paragraph, especially those of Henrietta M. Larson with J. H. Fricker, July 31, 1945, Ralph W. Hidy with R. F. Hawkins, June 7, 1948, and Ralph W. Hidy with W. E. Haley, Mar. 28, 1948.

12. SONJ, Minute Bk., The West India Oil Refining Co.

With modifications in the law there was no need to carry on the business in Cuba under the name of Conill and Archbold, and the name of The West India Oil Refining Co. was used. The capital stock was reduced in 1901 from $400,000 to $300,000.

13. SONJ, Certificate Bk. of West India Oil Company, charter, Minute Bk., and miscellaneous papers of West India Oil Co.; salary cards; notebook of Terhune with account of sales. H. G. Westcott was the president.

14. SONJ, Frank Wilson to C. C. Campbell, Sept. 22, 1911; ship charters for 1911. They show a number in the name of George W. Pitou, agent, Standard Oil Company of Brazil, for Pernambuco, Bahia, Rio de Janeiro, and other ports. By Sept., 1911, Standard Oil had 22 employees to be bonded in Brazil. Most were English, some Brazilian, and a few American, Dutch, and German.

15. Export Trade Recs., James Rennie, asst. secy., West Coast Oil Fuel Co., Ltd., to Asche, May 10, June 16, 1911; memo, May 26, 1911; Asche to C. E. Bedford, June 3, 1911; correspondence between W. C. O. F. Co. and Asche, 1911, *passim*.

The West Coast Oil Fuel Company, Ltd., incorporated in Great Britain on Apr. 5, 1911, had a capital of £100,000. Of this Lobitos Oilfields, Ltd., and Balfour, Williamson & Co., Ltd., held 30%. The directors appointed by Standard Oil were John H. Usmar (soon replaced by T. H. Hawks), F. E. Powell, and James Hamilton. Asche served as agent in New York.

In 1910 Peruvian benzine had been purchased for California from the London & Pacific Petroleum Co. and California fuel oil was shipped to Peru.

16. Export Trade Recs., Worthington and Chamberlain report, Mar. 3, 1910, and also a report by Crocker and Donnell, 1911; Arthur Corwin's report on trip to Mexico, 1911; Teagle to Arthur Corwin, Aug. 11, 1911; "Mexican Oil Notes," Sept., 1911; *Toledo Blade*, Jan. 17, 1899 (Lufkin's trip to Cuba); Archbold Recs., D. O'Day, Jr., to Barstow, Mar. 4, 1907 (enclosing report from Trinidad); Asche to E. T. Bedford and enclosures (reasons for not taking a concession in Colombia).

17. SONJ, old export statistics, F. D. Asche, Oct. 28, 1911.

18. Socony Recs., annual statistical report for 1906.

Naphtha exports sold by Standard Oil equaled 567,583 barrels of 42 gallons in 1906.

19. SONJ, old export statistics, F. D. Asche, Oct. 28, 1911; *U.S.* v. *SONJ*, Testimony, I, 93 (C. M. Pratt), 139 (W. H. Tilford); II, 862-864 (F. D. Asche).

The kerosene billed by Jersey Standard itself was sent largely to the American Petroleum Co.

20. *U.S.* v. *SONJ*, I, 140, 173, 175 (W. H. Tilford), 229 (R. D. Benson). The names of the refineries from which Standard Oil bought kerosene for export were Pittsburgh Oil Refining Co., A. D. Miller & Sons' Co., Seneca Oil Works, Cornplanter Refining Co., Conewango Refining Co., Glade Oil Works, Warren Refining Co., Emlenton Refining Co., Superior Oil Works, Levi Smith Refining Co., Lake Carriers Refining Co., Beaver Refining Co., Island Petroleum Co., Canfield Oil Co., Sterling Oil Works, and Tiona Refining Co.

The Export Trade Department headed by F. D. Asche quoted prices for export oil in New York, made sales, invoiced shipments, and handled accounts.

21. The material on Standard Oil's fleet comes from: SONJ, accounting papers, 1899-1911; old reports and lists from Register of Tankers, 1909; Elliott Recs., Asche to Elliott, Oct. 5, 1905, and Elliott to Asche, Oct. 6, 1905; Export Trade Recs., S. O. Co. cable to McDonald, Jan. 15, 1902; extract minutes of Det Danske directors' meeting, Jan. 12, 1904; McDonald to Asche, Jan. 25, 1904; American Petroleum to P. Ruprecht, Aug. 9, 1909; DAPG to Ruprecht, Apr. 8, 1909; Ruprecht to Riedemann, Jan. 31, 1910; Ruprecht to McGee, Dec. 5, 1910; von Hartz to Standard Oil Co. of New York, Dec. 31, 1912; Edwin L. Orde, "The Evolution of the Oil Tanker," *The Petroleum Review*, XX, No. 444 (Feb. 13, 1909), 92; Barringer, "The Evolution of the Oil Tank-ship," 287-288; *Oil, Paint & Drug Reporter*, LXXIII, No. 1 (Jan. 6, 1908), 10; Henry, *Thirty-Five Years*, 3 and 104; Bachof, "DAPG."

22. Elliott Recs., Walter C. Teagle to Elliott, Feb. 18, 1910; Socony Recs., annual statistical report for 1906.

In 1906 about 40 per cent of Standard Oil's exports were in containers, not in bulk. This included lubricants and kerosene for the East, South America, and other places where the market was small and the climate hot.

23. Export Trade Recs., Teagle to other directors of Det Danske, May 31, 1905 (italics authors'). The same idea was expressed in L. Roe, Jr., to Det Danske, Nov. 30, 1900.

24. Elliott Recs., Teagle to Elliott, Nov. 28, Dec. 7, 8, 1911; Elliott to Teagle, Dec. 7, 1911.

Most of the contracts were in the name of the Standard Oil Co. of New York.

25. Export Trade Recs., H. Riedemann to Bemis, Oct. 13, 1911.

26. *Ibid.*, Standard Oil Co. to Vestlandske, Apr. 27, 1910.

27. *Ibid.*, Donald to Asche, Dec. 26, 1903, Aug. 26, 1904 (quotation); H. Riedemann to Donald, Nov. 15, 1906; Donald to DAPG, May 28, 1906.

28. SONJ, Frank Wilson to A. H. Brainard, Nov. 27, 1911; F. D. Asche to Frank Wilson, Dec. 20, 1911.

29. SONJ, Osgood & Davis to Vacuum Oil Co., Jan. 23, 1909; C. Schuyler Davis of Osgood & Davis to Martin Carey, Mar. 19, 1909.

30. SONJ, Consol. Accts. of SONJ, 1899-1911; Elliott Recs., F. H. Bedford to Elliott, July 26, 1907; Elliott to Asche,

Feb. 15, 1911; Piesse & Sons to Elliott, Dec. 8, 1911.

For example, Anglo-American had sold lubricating oils at 4 per cent commission for the Thompson & Bedford Department to 1907.

31. SONJ, Consol. Accts. of SONJ, 1899-1911; *U.S. Consular Reports*, 1899-1911; Export Trade Recs., contract of Standard Oil Co. (N. J.) with Det Danske, Nov. 9, 1909, and memo of G. A. Stein, Sept. 6, 1909.

32. Export Trade Recs., Roe to Archbold, Dec. 11, 1902; von Hartz to McGee, Nov. 22, 1902, Apr. 15, 1905; Asche to Pratt, Jan. 30, 1905.

33. *Ibid.*, Roe to Dodd, Sept. 9, 1902; F. W. Randebrock, Otto Randebrock, A. Maquinay, and F. Speth to Roe, June 12, 1903 (quotation); Roe to American Petroleum, Aug. 11, 1903 (quotation); *The Lamp*, III, No. 3 (Oct., 1920), 19.

34. Export Trade Recs., T. C. Bushnell to McDonald, Nov. 1, 1901; McDonald to Bushnell, Nov. 22, 1901 (quotations).

35. *Ibid.*, McDonald to Bushnell, Oct. 26, 1901; Asche to Donald, Feb. 5, June 24, 1904; Donald to Asche, June 25, 1904; Teagle to Donald, July 22, 1904; Bachof, "DAPG," *passim*.

The Riedemanns' names are Heinrich Anton Joseph Maria Riedemann and Nicholas Anton Maria Riedemann (Dr. Jur.). Bemis followed Page on the executive committee in 1906, and Walter McGee succeeded Donald two years later.

36. Export Trade Recs., McDonald to Bushnell, Nov. 20, Dec. 3, 1901; L. Roe, Jr., for Bushnell to Archbold, Nov. 29, 1901.

37. *Ibid.*, McDonald to T. C. Bushnell, Nov. 20, 1901; Teagle to Donald, May 16, 1907.

38. *Ibid.*, McDonald to T. C. Bushnell, Jan. 15, 1902; McDonald to Asche, Feb. 17, 1904.

39. Dodd Recs., Dodd to Teagle, June 15 (quotation), Dec. 5, 1904; Export Trade Recs., McDonald to Asche, Feb. 17, 1904.

40. Export Trade Recs., copy of agreement between Standard Oil Co. (N. J.) and Det Danske, Nov. 9, 1909, ratified 1910; copy of agreement between Standard Oil Co. of New York and Det Danske, Nov. 9, 1909; Bemis to Det Danske, July 27, 1909; Elliott Recs., Teagle to Elliott, Dec. 7, 1911.

J. D. Archbold signed the Jersey Standard contract, H. M. Tilford that for New York. The capital of Det Danske was increased from 2,800,000 to 6,800,000 kroner, all the additional being subscribed by Jersey Standard.

41. Export Trade Recs., Holm to Bemis, June 4, 1910.

42. *Ibid.*, Donald to Asche, July 4, 1906.

43. *Ibid.*, G. A. Stein to Wade Hampton, Oct. 12, 1910 (quotation); correspondence between Holm and Bemis, 1910 and 1911, *passim*.

44. *Ibid.*, von Hartz to McGee, July 16, 1907, May 27, 1910; memo, Oct. 30, 1911.

45. *Ibid.*, Folger to Asche, Dec. 4, 1904; Asche to Folger, Dec. 7, 1904; Bachof, "DAPG," *passim*.

46. Export Trade Recs., "Application for Increase in Salaries of Employees," Roe to C. T. White, Mar. 3, 1903; McGee to von Hartz, Aug. 13, 1901, Apr. 21, 1903, Apr. 27, 1905, Jan. 26, 1909; Bemis to Det Danske, July 27, 1910.

47. *Ibid.*, T. C. Bushnell to C. M. Pratt, Dec. 27, 1899, and note; Roe to American Petroleum Co., July 26, Dec. 27, 1901; McDonald to Archbold, July 5, 1902; Roe to Dodd, Sept., 1902; H. Riedemann to McDonald, Nov. 16, 1900; C. F. Ackermann to DAPG, June 24, 1902; Asche to C. M. Pratt, June 9, 1905; Holm to Roe, July 14, 1902; Teagle to Det Danske, Feb. 17, Mar. 15, 1906; Holm to Bemis, July 17, 1911.

Standard Oil recommended dropping insurance on Anglo-American's property and Far Eastern stations in 1899 but not until later on Continental property because of the large minority interests.

48. Export Trade Recs., Teagle to Asche, Mar. 15, 1907; Bemis to DAPG, Apr. 5, 1909.

49. *Ibid.*, H. Riedemann to Donald, Jan. 23, 1905, May 22, 1906; Donald to DAPG, Mar. 17, June 13, 1906 (quotation).

50. *Ibid.*, Donald to DAPG, Jan. 20, 1905; Donald to A. H. Brainard, May

16, 1905; Brainard to Donald, June 12, May 17, 1905; Asche to Pratt, Jan. 17, May 19, 1905; Donald to American Petroleum Co., May 8, 1905 (quotation).

The suggested rates of depreciation were 5% on steamers, 6% on lighters, barges, store tanks, tankers, plants, buildings, tank cars, and office furniture, 12% on iron barrels, tank wagons, horses, station equipment and tools, and 36% on cases and cans.

51. Export Trade Recs., Holm to Teagle, June 19, 1905 (quotation); Holm to Bemis, Nov. 17, 1909 (quotation).

52. *Ibid.*, Bemis to Teagle, Sept. 9, 1909; Holm to Bemis, Apr. 23, 1910.

53. *Ibid.*, Donald to DAPG, Aug. 15, 1905; H. Riedemann to Donald, Jan. 26, 1905; Tonio Riedemann to Donald, Oct. 2, 1906.

54. *Ibid.*, H. Riedemann to Donald, Nov. 29, 1904, Aug. 5, 1905, Dec. 19, 1906, June 19, 1907; H. Riedemann to Teagle, Mar. 2, 1908; Bemis to DAPG, Apr. 26, 1909.

55. *Ibid.*, Donald to E. T. Bedford, Mar. 1, 1907; Teagle to Moffett, June 20, 1907.

56. *Ibid.*, Asche to Archbold, July 9, 1907; Donald to Moffett, July 10, 1907.

The American price for kerosene was raised in January from 4.40 to 4.50 cents per gallon, again in March to 4.75, and in June to 5, at which time the Russian was 5.82.

57. Export Trade Recs., Donald to E. T. Bedford, Mar. 1, 1907; Asche to Archbold, Mar. 1, 1907; Donald to DAPG, Feb. 24, 28, 1905; H. Riedemann to Donald, Dec. 23, 1905.

58. *Ibid.*, Roe to McDonald, Mar. 26, 1903; Asche to McDonald, Apr. 6, 1903; McDonald to Asche, Apr. 17, 1903; Teagle to Bemis, Sept. 2, 1910 (quotation).

59. Ibid., Donald to DAPG, May 26, June 29, 1905; unaddressed, unsigned memo, Dec. 17, 1907. The report is marked in pencil, "approved." It reads: "We feel it would be wise for us to advise the Continental Companies that in principle we would favor a lower level of Naphtha prices in Continental Europe, yielding from $1.00 to $2.00 a barrel net profit."

60. Export Trade Recs., Teagle to Det Danske, May 1, 1907.

61. *Ibid.*, Holm to Bemis, Dec. 23, 1909 (refers to 1901); SONJ, E. von Buren to Roe, May 30, 1895.

62. Export Trade Recs., Horstmann to Donald, Jan. 4, 1905; Donald to American Petroleum Co., Sept. 20, 1907; Asche to H. L. Pratt, Aug. 19, 1908.

63. *Ibid.*, C. A. Sutfield to Teagle, Sept. 22, 1904.

64. *Ibid.*, Teagle to DAPG, Nov. 10, 1910.

65. *Ibid.*, "Meeting of Foreign Representatives, Dec. 8, 1910." Those present were H. Riedemann, von Hartz, Hoff, Klaare, Maquinay, Powell, and James Hamilton, the latter two from Anglo-American.

66. Export Trade Recs., von Hartz to McGee, Mar. 5, 17, July 23, 1908; Teagle to McGee, May 16, 1908.

67. *Ibid.*, Teagle to C. M. Everest, Dec. 28, 1908.

68. *Ibid.*, Sutfield to Teagle, Aug. 30, 1904.

69. *Ibid.*, Holm to Bemis, Oct. 31, 1910.

CHAPTER 19

1. Material for much of the first section of this chapter comes from the many letters in the Export Trade Recs.

2. Archbold Recs., W. E. Bemis to C. M. Pratt, Feb. 8, 1904.

3. Export Trade Recs., James McDonald to Livingston Roe, Jr., Nov. 1, 1902; Roe to J. D. Archbold, Oct. 30, 1902; Roe to McDonald, Nov. 11, 1902; Roe for T. C. Bushnell to W. Rockefeller, Nov. 2, 1900; Bemis to E. T. Bedford, Aug. 2, 1904; Archbold Recs., memorandum, Apr. 24, 1904.

In the latter P. Ruprecht estimated the cost of shipping 65 pounds of kerosene (the weight of a case) to Calcutta: from Batum 17½ cents, from New York 21 cents, and from California 26 cents.

4. Export Trade Recs., P. H. Davis to Walter McGee, Feb. 12, 1906.

5. *Ibid.*, T. C. Bushnell to W. Rockefeller, Dec. 6, 1900, with note from C. M. Pratt.

6. *Ibid.*, Roe (for T. C. Bushnell) to Archbold, July 18, 1901.

7. *Ibid.*, J. W. Copmann to Roe, July 22, Oct. 3 (quotation), 11, 1901.

8. *Ibid.*, Roe to Standard Oil Co. of New York, Yokohama, Aug. 26, 29, 1901, Apr. 28, 1902 (quotation). (Italics are authors'.)

9. *Ibid.*, T. C. Bushnell to W. Rockefeller, Dec. 6, 1900; Roe, for T. C. Bushnell to Archbold, Feb. 27, May 14, 19, Dec. 7, 1901; McGee to P. H. Davis, Aug. 23, Dec. 13, 1904; Davis to McGee, Oct. 13, 1904. In the last-mentioned letter Davis, writing from Java, refers to the amazingly low costs of competitors as being discouraging "if we ever attempt to get the bulk of the native trade."

10. Export Trade Recs., Copmann to Roe, Oct. 3, 11, 1901.

11. *Ibid.*, Copmann to Roe, 1901-1902, *passim*; report of R. H. Hunt, J. W. Bolles, and J. W. Copmann, Mar. 18, 1902; "The Oil Markets of the East," *The Petroleum Review*, XVI, No. 397 (Apr. 27, 1907), 239-240, and No. 398 (May 11, 1907), 267.

12. SONJ, file on the *Oldhamia* case, including J. D. Archbold to John Hay, Secretary of State, Mar. 2, 1904 (quotation).

13. Elliott Recs., letters between Elliott and Bemis, 1904, *passim*; Export Trade Recs., Asche to E. T. Bedford, Aug. 7, 1906; McGee to Teagle, Oct. 21, 1910, and enclosures; Asche to Teagle, June 26, 1912; Export Trade Recs., Teagle to Sutfield, June 26, 1907; *U.S. Daily Consular & Trade Reports*, No. 291 (Dec. 13, 1911), 1310 and No. 299 (Dec. 22, 1911), 1479.

14. Archbold Recs., cables, Libby to Acme, Sept. 12, 15, 1902; Export Trade Recs., Bemis to Pratt, Jan. 10, 1904, Apr. 18, Nov. 15, 1905; Bemis to E. T. Bedford, Aug. 2, 1904.

15. SONJ, Salary Recs.; Consol. Accts. of SONJ, 1899-1911; Export Trade Recs., "Total Deliveries of Refined Oil," memo, Nov. 18, 1909.

16. Export Trade Recs., Roe to Archbold, Oct. 31, 1902; Roe to Pratt, Oct. 28, 1902; Asche to C. M. Pratt, Nov. 24, 1905; McDonald to Asche, Dec. 5, 1905; P. H. Davis to McGee, Feb. 28, Mar. 1, 1906; McDonald to Asche, July 4, 1906; Asche to McDonald, July 18, Feb. 27, 1906; Teagle to Bemis, June 2, 1911; Bemis to Teagle, June 9, 1911; Gerretson, *Koninklijke,* II, 496, III, 608-618; *U.S. Daily Consular & Trade Reports,* 1910 and 1911, *passim.*

17. Export Trade Recs., Asche to E. T. Bedford, Aug. 7, 1906; Bachof, "DAPG," *passim*; *The Petroleum Times,* Jubilee Number, LIII, No. 1353 (June 17, 1949), 514: *Oil, Paint & Drug Reporter,* LXXVII, No. 21 (May 23, 1910), 7-8.

18. Much of the material for this and following paragraphs comes from the sources cited as Export Trade Recs. Cf. Gerretson, *Koninklijke,* III (popular edition), 89-105.

19. Export Trade Recs., Asche to Archbold, Sept. 16, 1903.

DAPG's deliveries dropped almost 9 per cent in one year.

20. Export Trade Recs., A. von Hartz to Walter McGee, May 20, June 16, 1903; Tonio Riedemann to W. Donald, Apr. 20, 1905; Holm to Teagle, June 19, 1905; Teagle to Holm, June 29, 1908.

Teagle answered Holm's question about Pure Oil: "We do not know but doubt it."

21. Export Trade Recs., von Hartz to McGee, June 16, July 16, 1903; F. E. Powell to Asche, July 22, 1903; McGee to Italo-Americana, July 3, 1903.

22. *Ibid.*, Holm to McDonald, Dec. 18, 1901; McDonald to Roe, Jan. 6, 20, 1903; von Hartz to McGee, July 31, 1903, Jan. 13, Mar. 18, 1904, Mar. 25, Apr. 4, 1905, Mar. 28, 1906, Mar. 28, 1911; Roe to McDonald, Jan. 6, 1903; Holm to Teagle, Sept. 20, Nov. 22, 1905, Feb. 18, 1907; Holm to Bemis, Mar. 20, 1909.

Det Danske's "White Star" was one-half Water White from the United States and one-half Russian oil. When a new Swedish lamp, "Lux," was registered, Holm introduced "Luxpetroleum," part Russian kerosene and part Petrolite.

23. Export Trade Recs., Donald to DAPG, Nov. 30, 1904, June 28, Aug. 2, 1905; *The Petroleum Review,* XII, No. 325 (May 27, 1905), 406. Cf. *Report of the Commissioner of Corporations on the Petroleum Industry,* Part II (Washington, D.C.), 25.

24. Export Trade Recs., Donald to DAPG, Nov. 30, 1904, June 28, Aug. 2, 1905; H. Riedemann to Donald, Dec. 13, 1904, July 10, 1905; Bachof, "DAPG," *passim.*

25. Export Trade Recs., undated memos on shipments from the United States, 1907 and 1910.

26. T. J. Williams Recs., 1901-1902, *passim*; "The Anglo-American Oil Company Exhibit at the Franco-British Exhibition," *The Petroleum Review*, XIX, No. 428 (July 4, 1908), 3-4.

27. Export Trade Recs., copy of statutes of Petroleum Oefen und Lampen Handels GmbH, and memo of Gustav Otto Christoph Schmidt, manager, Feb. 13, 1904; H. Riedemann to Bemis, July 10, 1908 (quotation); "The World's Consumption of Illuminating Oil," *The Petroleum Review*, XII, No. 321 (Apr. 29, 1905), 325-326.

28. Export Trade Recs., Roe for T. C. Bushnell to Archbold, Oct. 14, 1902.

29. *Ibid.*, H. Riedemann to Donald, Feb. 28, 1906; DAPG to Donald, Feb. 20, 1906 (quotation).

30. *Ibid.*, von Hartz to McGee, June 5, 1902; McGee to Italo-Americana, Jan. 26, 1909.

31. *Ibid.*, H. Riedemann to Donald, Nov. 29, 1904; Tonio Riedemann to Donald, Dec. 27, 1904, Jan. 16, Apr. 12, 1905.

32. *Ibid.*, J. H. Usmar to Teagle, Feb. 14, 1905; "Meeting of Foreign Representatives, Dec. 8, 1910"; "The Anglo-American Oil Co., Ltd., and Its Great Distributing Organization," *The Empire Illustrated,* June, 1920, 58; "5 Decades of Progress, 1888-1938, Anglo-American Oil Company Limited," 11.

33. Export Trade Recs., Teagle to Donald, July 22, 1904; H. Riedemann to W. Donald, Aug. 13, 1905; Bemis to Teagle, Sept. 12, 1910 (quotation); Bachof, "DAPG," *passim.*

The success of jobbers in some localities slowed DAPG's progress in going into the jobbing business and introducing tank wagons. DAPG found the new method most satisfactory in medium-sized towns and in the country rather than in cities like Hamburg and Munich. In Berlin DAPG delivered supplies in barrels to jobbers until 1909. In that city Norddeutsche Eiswerke A. G. delivered kerosene in cans along with ice under an exclusive contract to take supplies from DAPG.

34. Export Trade Recs., von Hartz to McGee, Feb. 3, 1904; Teagle to Donald, July 16, 1906; McGee to G. H. Smith, May 23, 1911.

The Swiss market illustrated almost all competitive problems and the methods of meeting them. Italo-Americana delivered in Italy to retailers in cans and steel barrels.

35. Export Trade Recs., C. Sutfield to Roe, Apr. 16, 1903 (quotation); Roe for T. C. Bushnell to Archbold, Oct. 14, 1902; Roe to Sutfield, Feb. 20, 1903; H. J. Guthrie to Roe, June 27, July 8, 1903; Roe to McDonald, Feb. 8, 1904; Sutfield to Teagle, Apr. 11, 1904.

36. *Ibid.*, Holm to Bemis, June 2, 1910 (quotation); McDonald to Asche, Aug. 18, 1903; Sutfield to Powell, May 31, 1904.

37. *Ibid.*, Holm to Teagle, Aug. 8, 1905 (quotation); G. A. Stein, auditor, to Donald, Sept. 15, 1905; Sutfield to Donald, Sept. 29, 1905; Teagle to Det Danske, Aug. 23, 1905 (quotation); Sutfield to Teagle, June 11, 1907.

Sutfield believed that Holm, compensated as a general manager in part on a commission basis, was interested in immediate profits and gave only secondary consideration to "strengthening of our position or the weakening of our competitors."

38. Export Trade Recs., F. E. Schütte to American Petroleum Co., Aug. 25, 1903; DAPG to McDonald, Aug. 25, 1903; McDonald to DAPG, Aug. 27, 1903; McDonald to Asche, Aug. 27, Sept. 1, 2, 11, 1903; H. Riedemann to Donald, Mar. 23, Nov. 9, 1905, Oct. 15, 1906, Apr. 9, 1907; Donald to DAPG, Nov. 24, 1905, Jan. 16, May 18, Aug. 27, 1906; Dr. Heyl to Donald, Feb. 6, 1907.

Several groups were critical of DAPG for going into the tank-wagon business, including businessmen, chambers of commerce, government officials, and ministers.

Within a few months of its organization, "Favorit" Petroleum-Kannengeschaft delivered kerosene from two wagons

to about 1,400 customers and charged 2 pfennigs per liter more for its own "Favorit" brand than the tank-wagon price of 16 pfennigs to retailers. The company was financed by DAPG but in the name of its manager, Heinrich Goldhagen.

In February, 1907, Dr. Heyl wrote to explain DAPG's appropriations for introduction of the can system to the sales departments of Dresden, Erfurt, Chemnitz, and Mannheim: "At all the places mentioned above, the competition has a very considerable share of the business. We therefore hope that you will agree to the steps we intend taking."

39. SONJ, American Petroleum Co. accounts, Dec. 31, 1900; Export Trade Recs., von Hartz to McGee, June 16, 1903; W. R. King to Teagle, Sept. 2, 1904; H. Riedemann to Donald, Nov. 9, Dec. 4, 1905, Jan. 4, Aug. 13, 1906, Mar. 15, 1907; Donald to DAPG, Dec. 7, 1907; Bemis to H. Riedemann, June 23, 1908; reports of Dreyer to DAPG, Nov. 5, 1907, Dec. 1, 1909; Dreyer to H. Riedemann, Sept. 16, 1909, Aug. 3, 1910; Bemis to DAPG, Jan. 22, 1910; Tonio Riedemann to Bemis, Apr. 8, 1910, Oct. 9, 1911.

The new stove was the "New Perfection Junior Wick Blue Flame" stove, which sold for $1.25 f.o.b. Cleveland. It would burn Romanian oil satisfactorily as well as American kerosene.

40. Export Trade Recs., Bemis to DAPG, June 9, 1908, May 2, 1909; H. Riedemann to Bemis, July 13, 1908, Mar. 1, 1909; Tonio Riedemann to Bemis, Feb. 25, 1907, July 22, 1909, Aug. 19, 1910, Mar. 22, 1911; H. Riedemann to Teagle, Feb. 19, 1908; Bemis to H. Riedemann, June 23, 1908; W. Donald to DAPG, Mar. 11, 1907; H. Riedemann to Foreign Sales Dept. of SONJ, Mar. 11, 1912.

41. *Ibid.*, A. Maquinay to Donald, June 24, 1910; H. Riedemann to Teagle, Feb. 19, 1908, Oct. 22, 1910; H. Riedemann to Bemis, June 2, Dec. 2, 1909; Bemis to H. Riedemann, June 23, 1908, Jan. 22, 1910; Tonio Riedemann to W. E. Bemis, Oct. 29, 1908, Mar. 22, 1911; Tonio Riedemann to Foreign Sales Department, SONJ, Mar. 11, 1912; Bemis to DAPG, Aug. 4, Nov. 26, 1910; Riedemann to W. Donald, Nov. 9, 1905; Donald to DAPG, Nov. 24, 1905; Donald to Elliott, Aug. 28, 1906.

The can companies associated with DAPG and its affiliates were: "Favorit" Petroleum-Kannengeschaft, Hanover, 29 stations; Hanseatische Petroleum-Handels GmbH, Hamburg, 26 stations; Hesperus Petroleum-Handels GmbH, Erfurt, 26 stations; Lumina Petroleum-Vertriebs GmbH, Mannheim, 37 stations; Ostelbischer Petroleum-Vertrieb in Kannen, Danzig, 14 stations; Schlesische Petroleum-Vertriebs GmbH, Beuthen, 8 stations.

In 1906 Donald urged that the managers of the can companies not do any business in their own names, since investigations in the United States were giving prominence to "dummy companies," but even the cautious Elliott agreed that the companies might stay as they were, since the directors of DAPG were sure that they were not violating any laws in Germany.

42. Export Trade Recs., Tonio Riedemann to Bemis, Sept. 12, 1911 (quotation).

43. *Ibid.*, McDonald to Roe, Dec. 12, 1902; Tonio Riedemann to Donald, June 20, 1905; H. Olsen to McDonald, Jan. 13, 1905; Holm to Teagle, Mar. 1, 1905; letters of McDonald and Asche, 1905; McDonald to Roe, Mar. 28, 1903.

44. *Ibid.*, copy of agreement between Société Belgo-Hollandaise des Pétroles and American Petroleum, Mar., 1902; copy of agreement between DAPG and DRNIG, Feb., 1903; copy of agreement between Naphtha-Productions Gesellschaft Gebrüder Nobel and Det Danske, 1902; copy of agreement between DAPG and Deutsche Petroleum Verkaufs-GmbH (Petronaft), May, 1907; Donald to DAPG, Mar. 8, 1907; H. Riedemann to Bemis, June 20, 1910; copy of agreement between DAPG and DRNIG, July, 1900; copies of agreements between European Petroleum Union and Pico, Apr., 1907, and Italo-Americana, Jan., 1908, and Rieth, Apr., 1907, and Det Danske, Apr., 1908; American Petroleum Co. to Teagle, Mar. 22, 1910; protocol of meeting, Berlin, June 9, 1910, von Gwinner, Riedemann and Teagle; Elliott Recs., Elliott to Page, July 8, 1903; Gerretson, *Koninklijke*, III (popular edition) 108-109.

45. Export Trade Recs., copy of agreement between Det Danske and European Petroleum Union, Apr., 1908; protocol of meeting of representatives of European Petroleum Union and Det Danske, Apr. 1, 1911; Holm to Bemis, Oct. 22, 1910; Bemis to DAPG, Nov. 7, 1910; Teagle to Maquinay, Jan. 18, 1912.

46. *Ibid.*, H. Riedemann to Bemis, Mar. 24, 1910 (quotation); cable, Teagle to S. O. Co., June 27, 1908.

47. Cf. Gerretson, *Koninklijke*, II, 496, in reference to Asia.

48. Export Trade Recs., McDonald to T. C. Bushnell, Mar. 7, 1901.

49. *Ibid.*, Teagle and A. C. Bedford to J. A. Moffett, May 23, 1910.

50. *Oil, Paint & Drug Reporter*, LVII, No. 4 (Jan. 22, 1900), 27 (quotation).

51. Export Trade Recs., Asche to C. M. Pratt, Feb. 16, 1905; McDonald to Holm, Sept. 24, 1902; Asche to J. D. Archbold, Sept. 16, 1903; Asche to C. M. Pratt, Feb. 18, 1904; Dodd Recs., Dodd to Howard Page, Feb. 3, 1904; *The Petroleum Review*, XII, No. 321 (Apr. 29, 1905), 318; XIII, No. 335 (Aug. 5, 1905), 101, and No. 356 (Dec. 30, 1905), 522-523 (see chart of prices); and XV, No. 376 (July 7, 1906), 14; *Oil, Paint & Drug Reporter*, LXV, No. 26 (June 27, 1904), 55.

52. Export Trade Recs., McDonald to Asche, 1905, *passim*; Donald to DAPG, Mar. 8, 1907; F. E. Powell to Teagle, June 13, 1907; *The Petroleum Review*, XV, No. 387 (Dec. 8, 1906), 306.

53. Export Trade Recs., "Meeting of Foreign Representatives, Dec. 8, 1910"; *The Petroleum Review*, XXI, No. 454 (July 3, 1909), 2, and XXII, No. 468 (Jan. 15, 1910), 42; *Engineering and Mining Journal*, LXXXVIII, No. 15 (Oct. 9, 1909), 737.

54. Export Trade Recs., Teagle to C. M. Everest, Dec. 23, 1908.

55. *Oil, Paint & Drug Reporter*, LXXVIII, No. 15 (Oct. 10, 1910), 28D (quotation); *The Petroleum Review*, XXV, No. 513 (Oct. 7, 1911), 235-236 (quotation).

56. Export Trade Recs., Teagle and A. C. Bedford to J. A. Moffett, May 23, 1910; Gerretson, *op. cit.*, III (popular edition), 314-315.

57. Export Trade Recs., H. Riedemann to Teagle, May 26, 1910 (quotation); cable to Teagle from New York, May 31, 1910.

58. *Ibid.*, protocol of meeting, Berlin, June 9, 1910; Teagle to Moffett, May 28, 1910.

59. *Ibid.*, Bemis to Teagle, June 22, 1910.

60. *Ibid.*, protocol of meeting, June 9, 1910; memo, June 20, 1910; memo, June 21, 1910 (quotation); Bemis to Teagle, June 22, 1910.

61. *Ibid.*, Libby to Teagle, Apr. 10, 1911; copy of Libby to Secy. of State, Apr. 24, 1911; H. Riedemann to Teagle, July 18, Aug. 8, 17, Sept. 12, 1911; Teagle to H. Riedemann, July 26, 1911; Teagle to A. C. Bedford, Nov. 28, 1912; H. Riedemann to Teagle, May 26, 1910; *Frankfurter Zeitung*, July 13, 1911; *New-Yorker Handels-Zeitung*, Mar. 18, 1911; *New York Times*, Feb. 20, 1912; *The Petroleum Review*, XXIV, No. 500 (Apr. 8, 1911), 214.

62. Export Trade Recs., H. Riedemann to Teagle, May 26, 1910 (quotation), and Oct. 17, 1911 (quotation).

63. *Ibid.*, Dr. Herz and F. Lane for British Petroleum to Donald, Aug. 29, 1907; memo dated Nov. 25, 1907; Teagle to Bemis, June 5, 1908; Teagle to H. Riedemann, July 1, 1911; J. Lamont to Teagle, Nov. 2, 1911; Teagle to Holm, July 1, Nov. 8, 1911; Teagle to James W. Gerard, Feb. 27, 1914; Eliott Recs., Elliott to Teagle, 1910-1911, *passim*; *Berlin Tageblatt*, May 24, 1911.

The personal friends were A. C. Bedford, H. C. Folger, Jr., L. J. Drake, and J. A. Moffett.

64. Export Trade Recs., Teagle to Maquinay, Sept. 26, 1910 (quotation); *Oil, Paint & Drug Reporter*, LXXVII, No. 25 (June 20, 1910), 7, and LXXVIII, No. 15 (Oct. 10, 1910), 28D.

65. SONJ, old export statistics, F. D. Asche, Oct. 28, 1911; Export Trade Recs., memo on DAPG; *Mineral Resources, 1911*, 115.

66. "A Historical Account, Anglo-Amer-

ican Oil Co.," 6-7; *The Petroleum Times,* LIII, No. 1353 (June 17, 1949), 5; *The Petroleum Review,* 1899-1911, *passim.*

67. Socony Recs., annual statistical report for 1906; SONJ, old export statistics, F. D. Asche, Oct. 28, 1911; Export Trade Recs., Românо-Americana to Asche, Sept. 5, 1905; Folger to Asche, Aug. 31, 1906; Anglo-American to H. P. Chamberlain, May 2, 1908; *The Petroleum Review,* XXIV, No. 500 (Apr. 8, 1911), 192.

68. Export Trade Recs., A. Maquinay to Teagle, Feb. 12, 1909; Horstmann to Teagle, Feb. 11, Mar. 10, 1909; American Petroleum Co. to Teagle, Mar. 22, 1910.

69. *Ibid.,* Asche to McDonald, June 10, 1904 (quotation); Holm to Teagle, Apr. 8, Aug. 19, 1905; Teagle to Det Danske, June 1, 1905; Asche to Folger, Nov. 11, 1904, Sept. 25, 1905.

70. *Ibid.,* Holm to Teagle, July 5, 1904; L. C. Panizzardi to C. E. Bedford, Dec. 10, 1909; C. M. Everest to Bemis, June 14, 1910 (quotation).

71. *Ibid.,* Teagle to American Petroleum Co., Jan. 11, 1909; J. Donald to American Petroleum Co., May 5, 1910 (quotation).

72. *The Petroleum Review,* XXIII, No. 483 (Aug. 13, 1910), 112 and 122, and XXIV, No. 501 (Apr. 22, 1911), 237.

73. *The Petroleum Review,* XXI, No. 464 (Nov. 20, 1909), 291; Export Trade Recs., Asche to Teagle, June 26, 1912.

Asche's estimates of world consumption of naphtha products were 9,100,000 barrels in 1906 and 20,700,000 in 1911. This estimate was probably in 50-gallon barrels.

74. Export Trade Recs., Donald (DAPG) to Donald, N. Y., Sept. 24, 1904; H. Riedemann to Donald, Feb. 28, Mar. 6, 1905; H. Riedemann to Bemis, Nov. 20, 1909, Feb. 21, 1910; von Hartz to McGee, Feb. 6, July 16, 1907; "A Historical Account, Anglo-American Oil Company," 6.

75. Export Trade Recs., Donald to DAPG, Apr. 3, 1906; H. Riedemann to Donald, Nov. 9, 1906, Aug. 14, 17, 1907; H. Riedemann to Bemis, Mar. 7, June 30, Dec. 15, 1910; Tonio Riedemann to Bemis, Nov. 15, 1909.

76. SONJ, coupon book of DAPG; Export Trade Recs., W. M. McGee to Italo-Americana, Aug. 16, 1911; H. Riedemann to Bemis, Dec. 6, 1911; Bachof, "DAPG," *passim.*

The latter refers to 2,500 Dapolin stations by 1911. The revised coupon book of DAPG in 1911 included maps of cities as well as of Germany.

77. Export Trade Recs., O. Horstmann to McGee, Oct. 2, 1911; W. Hormann to McGee, June 11, 1911.

78. "A Historical Account, Anglo-American Oil Company," 5; *The Petroleum Review,* XI, No. 282 (July 30, 1904), 88, and XII, No. 321 (Apr. 29, 1905), 321 (quotation); "The Anglo-American Oil Co., Ltd., and Its Great Distributing Organization," *The Empire Illustrated* (June, 1920), 58.

79. Export Trade Recs., Powell to Teagle, Dec. 8, 1906; *The Petroleum Review,* XVI, No. 392 (Feb. 15, 1907), 90, and XX, No. 450 (May 8, 1909), 261 (quotation); *Oil, Paint & Drug Reporter,* LXXVII, No. 8 (Feb. 21, 1910), 57; *The Petroleum Times,* LIII, No. 1353 (June 17, 1949), 413.

In 1909, of the 51,800,000 imperial gallons imported to the United Kingdom, 18,860,000 were from the United States.

80. Export Trade Recs., C. Holm to Teagle, Aug. 5, 1905; Bemis to Det Danske, Sept. 23, 1909; Holm to Standard Oil Co. of New York, Jan. 9, 1912; McDonald to A. Maquinay, July 8, 1904; McDonald to Asche, Aug. 4, 1904; W. Klaare to James Donald, June 1, 1910; Teagle to DAPG, July 27, 1910.

81. *Ibid.,* McGee to von Hartz, May 10, 1905 (quotation); von Hartz to McGee, Apr. 20, 1905, Dec. 10, 1909.

82. *Ibid.,* "Meeting of Foreign Representatives, Dec. 8, 1910"; *The Petroleum Review,* XXIII, No. 486 (Sept. 24, 1910), 189.

The Petroleum Review, as well as the American Petroleum Co., gave Royal Dutch credit for starting the price war in Holland in 1910. This point of view should be compared with Deterding's statement in his annual report.

83. Export Trade Recs., Tonio Riedemann to Bemis, Jan. 30, Feb. 2, Sept. 16, 1911.

The Benzine Syndicate's introduction of a new brand of gasoline, "Dynamin," early in 1911, resulted in vigorous competition. Dr. Tonio Riedemann reported that because of the competitors' underselling he had increased the discretion of DAPC's stations to sell below the company's official quotations.

CHAPTER 20

1. James Roscoe Day, *The Raid on Prosperity* (New York, 1907), 164-167; *Ind. Comm.* I, 565.

2. Unless otherwise stated, all the material for this section comes from a study of SONJ, Salary Bks. A, B, C, and D (1886-1901), and cards, 1902-1911; and special salary bks.: Standard Oil Co. of New York, No. 1 (1882-1883), No. 2 (1884-1893); Employees Register and Pay Roll, Standard Oil Co. of New Jersey (*sic*), No. 1 (1899-1904), No. 2 (1905-1916); Payroll Book, Directors, 1910-1931.

3. The median is used throughout for the average. Since salary cards were removed when men were transferred from one company to another in the combination, information as of any one date is less complete for the years after 1901.

4. Elliott Recs., Virgil P. Kline to Elliott, Jan. 26, 1912; Elliott to Kline, Jan. 24, 1912; F. A. Quail to Elliott, May 2, June 21, 1912; Elliott to Quail, June 22, 1912.

5. O'Day Recs., Strong to O'Day, May 3, 1904.

6. *Ibid.*, W. R. King, Domestic Trade Dept., to O'Day, Jan. 15, 1904. King wrote: "We usually take in very young men and educate them to fill the various positions."

7. Rockefeller Recs., Rockefeller to W. P. Thompson, June 12, 1885.

8. *Ibid.*, Charles Pratt to Rockefeller, Aug. 3, 1889.

9. O'Day Recs., 1903, *passim;* W. Church to Forrest M. Towl, Dec. 9, 1903 (quotation).

10. Interview of J. S. Ewing with G. H. Smith, Nov. 25, 1948.

11. Rockefeller Recs., George D. Rogers to Rockefeller, June 13, 27, 1888.

Memories of men interviewed differ as to the date that the 5½-day week was extended throughout the year. Both 1910 and 1913 were mentioned.

12. Interview of J. S. Ewing with G. H. Smith, Nov. 25, 1948.

13. O'Day Recs., J. Page to O'Day, Oct. 29, 1903; O'Day to J. Page, Oct. 22, 1903. O'Day wrote, "I write for the purpose of saying that it is contrary to the policy of the Company to allow any of its employees to become interested in the producing business, as it leads to many things."

14. Rockefeller Recs., 1882 to 1892, *passim*, especially F. B. Squire to Rockefeller, May 14, 1889 (quotation); O'Day to Rockefeller, Mar. 27, 1890. The last letter refers to obtaining 2,000 shares for pipeline men.

15. O'Day Recs., E. R. Shepard, agent United Pipe Line Division, National Transit Co., to O'Day, Mar. 3, 1902.

16. Archbold Recs., Worthington to Fred Mohr, Jr., Nov. 22 (quotation), 25, 1910.

17. *Ibid.*, Worthington to Fred Mohr, Jr., Nov. 22, 1910.

18. Material for the following pages comes from the O'Day Recs., 1902-1905, *passim*.

19. The example given is of salaried employees. National Transit Co. paid gaugers $100 per month, plus $10 for horse feed; this was 10 per cent higher than Tide Water paid.

20. O'Day Recs., E. Strong to O'Day, Aug. 5, 1904. Strong wrote of W. W. Richardson: "He is at home with the businessman; can meet the public, and will please them in his straightforward and gentlemanly manner, in taking up whatever they bring before him."

21. O'Day Recs., Page to C. N. Payne, Sept. 28, 1903.

22. *Ibid.*, Page to O'Day, Jan. 19, 1904.

23. *Ibid.*, O'Day to John McManus, June 3, 1904; Derrick's *Handbook,* I (Feb. 19, 1891), 520.

24. O'Day Recs., J. McManus to O'Day, June 3, 1904.

25. *Ibid.*, O'Day to Rogers, June 25, 1902; Otto R. W. Klose to O'Day, July 7, 1902; Forrest M. Towl to Joseph B.

Keegan, Rector, Crown, Pa., Feb. 20, 1904; Derrick's *Handbook*, I (Feb. 19, 1891), 520.

26. O'Day Recs., John Bushnell to O'Day, July 29, 1902; E. Strong to O'Day, Sept. 30, 1902; M. B. Daly to O'Day, June 11, 1903, Sept. 30, Oct. 26, Nov. 9, 1903.

27. Socony Recs., copy of the schedule submitted by the Standard Oil Trust to the Bureau of Census regarding manufacturing operations in 1889.

28. *N. Y. Sen. Rept. No. 50* (*1888*), 451; Paul H. Douglas, *Real Wages in the United States, 1890-1926* (Boston, 1930), 271 and 296.

29. SONJ, Baltimore Refinery, hourly wage books, 1899-1911; *Oil City Derrick*, Nov. 22, 1907, reprint of an article which C. W. Archbold wrote at the request of the Parkersburg *Dispatch News*.

30. Douglas, *op. cit.*, 296-297; *New York Herald*, Oct. 6, 1907, magazine section, 2.

31. Interviews of R. W. Hidy with W. G. Keller and C. A. Hancock, Oct. 27, 1949.

32. Socony Recs., copy of the schedule submitted by the Standard Oil Trust to the Census Bureau regarding manufacturing operations in 1889.

33. Report of the Immigration Commission, *Immigrants in Industries* (61st Congress, 2d Session, Document No. 633. Washington, 1911. Hereinafter cited *Immigrants in Industries*), 802; SONJ, outline of talk by W. F. Thiede, 1947; *New York Tribune*, May 6, 1913.

34. SONJ, Baltimore Refinery, hourly wage books, 1899-1911; Seth B. Hunt, "The Evening of April First," *The Lamp*, I, No. 1 (May, 1918), 9.

35. Lepley Recs., G. P. France to H. B. Lepley, June 3, 1897 (quotation); Luke Mooney to H. B. Lepley, May 5, 1897.

36. Department of Commerce and Labor, Bureau of Labor, *Laws relating to the Employment of Women and Children in the United States* (Washington, 1907), 84-85; *Philadelphia Record*, Jan. 22, 1908; Dodd Recs., S. C. T. Dodd to James G. Newcomb, Dec. 15, 1902. "It is always a little hazardous to employ boys under the age of eighteen in work that is at all dangerous, for the reason that juries will find that they were too young to understand the dangers under which they were employed."

37. SONJ, two books reporting accident cases in the refineries of Standard Oil Co. of New York and Standard Oil Co. (New Jersey); Dodd Recs., S. C. T. Dodd to H. C. Folger, Jr., Oct. 10, 1904; S. C. T. Dodd to Col. Charles W. Fuller, Mar. 26, 1904; S. C. T. Dodd to Jacobson & Siegel, Mar. 28, 1904.

38. Elliott Recs., Elliott to L. L. Graham, Oct. 25, 1901.

39. Dodd Recs., S. C. T. Dodd to C. W. Fuller, Nov. 19, 1903. (Italics by the authors.)

40. Generalizations on foremen are derived from numerous interviews.

41. Lepley Recs., G. P. France to H. P. Lepley, June 3, 1897.

42. *Immigrants in Industries*, 800, 804.

43. *Ibid.*, 760.

44. Socony P. P. Co. Recs., H. C. Folger, Jr., to Hopper, Apr. 2, 1886.

45. Nevins, *Rockefeller*, II, 721.

46. *Oil, Paint & Drug Reporter*, XLVI, No. 4 (July 23, 1894), 7; *The Engineering & Mining Journal*, LVIII, No. 2 (July 14, 1894), 39.

47. Dodd Recs., S. C. T. Dodd to J. A. Moffett, Mar. 26, 1903; *New York Tribune*, Feb. 26, 1903; New York *Sun*, Mar. 2, 4, 1903; *New York Herald*, Mar. 8, 1903; New York *World*, Mar. 21, 1903.

48. Dodd Recs., S. C. T. Dodd to George Gunton, Mar. 30, 1903.

49. T. J. Williams Recs., Williams to C. M. Pratt, Apr. 20, 1903; O'Day Recs., C. N. Payne to O'Day, May 1, 1903; O'Day to H. H. Rogers, May 8, 1903, Apr. 26, 1904; O'Day to J. D. Rockefeller, Oct. 21, 1903, Jan. 4, 1904; Export Trade Recs., H. Riedemann to W. Donald, Dec. 28, 1904.

50. Export Trade Recs., F. E. Schütte to C. F. Ackermann, Dec. 19, 1892; H. Riedemann to W. Donald, Dec. 28, 29, 1904, Dec. 18, 1906; Murray Webb Latimer, *Industrial Pension Systems in the United States and Canada* (New York, 1932), 17-19.

When Schütte wrote that the managers of DAPG wished to follow the practice of other large corporations in Germany in

providing pensions for retired clerks, he gave two reasons: DAPG wished to reward men for long and faithful service and to attach the employees to the company.

51. O'Day Recs., C. N. Payne to O'Day, May 1, 1903.

52. Latimer, *op. cit.*, 20-25, 35-36, 39-40.

53. SONJ, Minute Bk., Jan. 14, 1903, Jan. 20, 1910; annuity plans, 1903 and 1909. The latter went into operation on Dec. 1, 1909.

54. SONJ, Bergenport Chemical Co. Recs., W. P. Howe to A. C. Bedford, Dec. 13, 1902; O'Day Recs., O'Day to J. C. Russell, Nov. 29, 1904 (quotation).

55. Dodd Recs., S. C. T. Dodd to C. E. Hunter, Jan. 2, 1903.

56. SONJ, annuity books; morgued annuitant cards of Standard Oil Co. of New York and other subsidiaries; lists of companies with annuity plans, summaries of annuities paid and letters; The Carter Oil Company, Minute Books, May 10, 1904, Dec. 9, 1909; Export Trade Recs., W. Riedemann to W. McDonald, Dec. 18, 1906; extract from auditor's report on American Petroleum Co., July 5, 1910.

American Petroleum Co. introduced compulsory contributory annuities in 1910.

By April, 1911, the Standard Oil companies with the largest number of annuitants were New York Standard with 96, Ohio Standard with 57, Jersey Standard with 45, Atlantic Refining with 45, National Transit with 41, and Indiana Standard with 34.

57. SONJ, Bergenport Chemical Co. Recs., A. C. Bedford to G. W. Van Winkle, Dec. 19, 1902.

58. O'Day Recs., O'Day to J. D. Rockefeller, Oct. 21, 1903; O'Day to H. H. Rogers, May 8, 1903. These letters are examples of recommendations by various officers and of the interest shown by many, up to John D. Rockefeller himself. O'Day wrote of one man that he was sixty-seven, "not fit to do work, nor in circumstances to live without work," and recommended a pension in spite of the fact that he had worked for Standard Oil only 14 years.

59. O'Day Recs., W. W. Splane to O'Day and C. N. Payne, Dec. 31, 1904.

60. *Ibid.*, O'Day to J. C. Russell, Nov. 29, 1904.

61. O'Day Recs., O'Day to T. A. McLaughlin, Sept. 11, 1903.

62. SONJ, Bergenport Chemical Co. Recs., W. P. Howe to A. C. Bedford, Dec. 13, 1902.

63. *New York Journal American*, Jan. 29, Mar. 21, 1903; New York *World*, Jan. 30, 1903. For favorable reports see *New York Times*, Dec. 30, 1902, and Philadelphia *Press*, Dec. 31, 1902.

64. *Paint, Oil &Drug Review*, Jan. 22, 1908.

CHAPTER 21

1. Rockefeller Recs., Rockefeller to J. A. Bostwick, July 3-6, 1885.

2. In the case of Connecting Gas and West India Oil Refining the qualifying shares of the directors brought the holdings of Jersey Standard and its directors to over 50%.

3. Companies Held by Standard Oil Company (New Jersey) and Affiliates, Which Were Absorbed, Sold, Reorganized, or Liquidated, 1899-1911

Company	*Last Appearance on Consolidated Accounts*	*Properties or Shares Purchased by*
Argand Refining Co.	1902	*
Capital City Oil Co.	1901	Atlantic Refining Co., The
Central Refining Co., Ltd.	1899	Standard Oil Co. of New York
Denlinger Brothers Oil Co.	1905	Atlantic Refining Co., The
East Ohio Gas Co., The	1910	East Ohio Gas Co., The (new)
Empire Refining Co., Ltd.	1910	Standard Oil Co. of New York
Empreza Industrial de Petroleo	1910	Standard Oil Co. of Brazil

3. Companies Held by Standard Oil Company (New Jersey) and Affiliates, Which Were Absorbed, Sold, Reorganized, or Liquidated, 1899-1911 (*Continued*)

Company	*Last Appearance on Consolidated Accounts*	*Properties or Shares Purchased by*
Forest Oil Co.	1901	Prairie Oil & Gas Co., The
Galena Oil Co.	1901	Galena-Signal Oil Co.
Inland Oil Co.	1900	Standard Oil Co. (Kentucky) and Waters-Pierce Oil Co.
Liebig Manufacturing Co., The	1899	American Agricultural Chem. Co., The[b]
Lawrence Natural Gas Co.	1908	Peoples Natural Gas Co., The
Mahoning Gas Fuel Co., The	1908	Peoples Natural Gas Co., The
Mountain State Gas Co., The	1909	[a]
National Storage Co.	1899	Lehigh Valley Railroad Co.[b] and New Jersey Storage Co.
New Jersey Storage Co.	1906	Standard Oil Co. (New Jersey)
North Western Ohio Natural Gas Co.	1909	[c]
Pittsburgh Natural Gas Co.	1906	Peoples Natural Gas Co., The
Rasin Fertilizer Co., The	1900	[a]
Republic Oil Co.	1906	Standard Oil Co. (Ind.), Standard Oil Co. (Ohio), The, and Waters-Pierce Oil Co.
Signal Oil Co.	1901	Galena-Signal Oil Co.
Standard Oil Co. (Missouri)	1899	[a]

[a] Disposition unknown.
[b] These were the only two instances in which Jersey Standard's holdings were sold to outsiders.
[c] Liquidated in 1910.
Source: SONJ, Consol. Accts. of SONJ, 1899-1911, and other papers of various companies.

4. *Texas* v. *Magnolia Petroleum Co., Standard Oil Co.* (*N. J.*), *et al.* (1913).

5. Rockefeller Recs., L. D. Clarke to Rockefeller, Aug. 28, 1890. The various associated companies of Standard Oil held \$3,550,000 in government bonds at the end of 1889.

6. National Transit redeemed all its outstanding bonds in 1884.

7. Rockefeller Recs., Rockefeller to S. V. Harkness, July 7, 1884; G. D. Rogers to Rockefeller, Nov. 8, 1891.

8. *Ibid.*, Standard Oil Co. of New York, loans, Mar. 21, 1893. Some 46% of the loans of that date were on call; the rest were loaned at interest ranging from 4 to 6% per annum.

9. The companies acquired by Jersey Standard in 1905 from National Transit were as follows: Carter Oil, Marion Oil, and Washington Oil, producers; Clarksburg Light and Heat, Hope Natural Gas, Lawrence Natural Gas, Mahoning Gas Fuel, Mountain State Gas, Peoples Natural Gas, Pittsburgh Natural Gas, Reserve Gas, River Gas, and Taylorstown Natural Gas; and the Crescent Pipe Line and South-West Pennsylvania Pipe Lines.

10. SONJ, Consol. Accts. and trial balance of Loan Ledger, Jersey City Office, Dec. 31, 1911.

11. SONJ, Consol. Accts. of SONJ, 1899-1911, and trial balance, Deposit and Short-Term Loan Ledger, Jersey City Office, Dec. 31, 1911. No compilation of Jersey Standard's earnings as an operator of manufacturing and marketing activities in 1899 has been found.

12. The figures for investment in bonds of Standard Oil units were as follows: Prairie Oil & Gas, \$17,000,000; Ohio Oil, \$5,500,000; DAPG, \$3,562,898; Schwei-

zerische Handels- und Beteiligungs-Aktiengesellschaft, $3,046,615; Vacuum Oil, $2,000,000; East Ohio Gas, $859,092; Ohio Fuel Supply, $824,725. The other sum included in the $34,654,322 was $1,860,992 in bonds of the United States Natural Gas Co., in which some Standard Oil stockholders had an interest.

13. The following paragraphs are based on: SONJ, list of loans, Dec. 12, 1911; memorandum, 1911; and file of letters referring to loans addressed to treasurers and assistant treasurers of Standard Oil Co. of New York.

14. The authors put the loans into categories on the basis of information in letters and a knowledge of the functions of the borrowers.

15. SONJ, A. C. Bedford to Jesup & Lamont, Dec. 12, 1911.

16. SONJ, W. P. Howe, Standard Oil Co. of New York, to W. J. Young, June 25, 1908; see above, Chapter 13.

17. SONJ, list of loans, Dec. 12, 1911; R. Greenwood to Fred Mohr, Jr., Feb. 1, 1908; R. Greenwood to F. Q. Barstow, Jan. 18, 1908; Wade Hampton to Howe, Apr. 12, 1909 (F. L. Benton); Howe to A. C. Bedford, Jan. 10, 1908; Bedford to Howe, Feb. 18, 1909; Bedford to J. W. R. Crawford, Aug. 25, 1911.

In cases where no "special account" is placed after an officer's name, the authors have not been able in every case to judge whether the loan was for personal use. Depending on judgments made, loans to employees were between $30,000 (on which correspondence remains) and $656,000.

18. Export Trade Recs., Frank Wilson to W. M. McGee, Mar. 27, 1911.

19. SONJ, Howe to W. E. Bemis, Sept. 18, 1909; Bemis to Howe, Oct. 18, 1909; Export Trade Recs., Frank Wilson to W. M. McGee, Mar. 27, 1911.

For payments by Italo-Americana, for example, Standard Oil Co. of New York drew on bankers in London, Zurich, or Berlin throughout this period.

20. Export Trade Recs., J. McDonald to L. Roe, Jr., Dec. 12, 1902; DAPG to W. G. Rockefeller, Jan. 19, 1903; Howe to W. Donald, Jan. 18, 1905.

21. *Ibid.*, Donald to Asche, June 29, July 13, 1904; Asche to Donald, July 12, 26, 1904; DAPG to W. G. Rockefeller, June 30, Aug. 8, 1904; E. von Buren to W. G. Rockefeller, Aug. 3, 1905; E. von Buren to Donald, Feb. 19, 1906; H. Riedemann to Bemis, Aug. 21, 1911; Teagle to DAPG, Sept. 6, 1911; Bemis to DAPG, Sept. 8, 1911; Asche to Frank Wilson, Dec. 20, 1911; Bemis to DAPG, Sept. 19, 1911.

22. SONJ, Howe to Bemis, Sept. 18, 1909; Bemis to Howe, Oct. 18, 1909 (quotes letter from F. D. Asche); Frank Wilson to Bemis, Feb. 23, 1911.

In 1911 Frank Wilson, who had succeeded to the assistant-treasurership of New York Standard on Howe's death, again proposed for Det Danske a running account on the books of Philip Ruprecht, agent of New York Standard, to which remittances would be credited and payments for shipments debited.

23. Export Trade Recs., A. von Hartz to W. M. McGee, Feb. 3, Mar. 1, 1904; Howe to Italo-Americana, May 25, 1906; Italo-Americana to treasurer, Standard Oil Co. of New York, June 6, 1906.

24. SONJ, Asche to Frank Wilson, Dec. 20, 1911.

25. SONJ, Howe to A. H. Brainard, Jan. 14, 1907 (quotation); Howe to Brainard, July 16, 1906.

26. SONJ, Howe to Martin Snider, The Interstate Cooperage Co., Sept. 15, 1908; Snider to Howe, Sept. 17, 1908 (quotation).

27. SONJ, Consol. Accts. of SONJ, 1899-1911. In the totals given for these years, which aggregate $5,819,749, is included about $405,000 for Jersey Standard's proportion of fire losses in affiliates' operations abroad.

28. Export Trade Recs., Donald to H. Riedemann, Jan. 23, 1906. "In relation to the Fire Insurance Reserve Fund for your plants, would state that this is something we do not use here and do not care to have you establish."

29. Export Trade Recs., Livingston Roe, Jr., to J. McDonald, June 24, 1902.

30. *Ibid.*, T. C. Bushnell to C. M. Pratt, Dec. 27, 1899, and note by C. M. P.; Howard Page to W. M. McGee, June 13, 1900; J. McDonald to J. D. Archbold,

July 5, 1902; C. F. Ackermann to DAPG, Aug. 19, 1902; F. W. Randebrock to L. Roe, Oct. 1, 27, 1902; Donald to DAPG, Aug. 26, 1904; C. E. Stubbe to W. C. Teagle, Oct. 27, 1905; H. Riedemann to Donald, Aug. 2, 1904, Aug. 11, Nov. 9, Dec. 5, 1906; Donald to P. Ruprecht, Dec. 12, 1905; W. Klaare to Donald, Apr. 10, 1906; McGee to von Hartz, Aug. 2, 1904, June 9, 1905; von Hartz to McGee, July 5, 1905, May 23, 1906; Dodd Recs., S. C. T. Dodd to Asche, Nov. 25, 1904; Dodd to Edward T. Wellington, Nov. 28, 1904 (quotation).

31. Export Trade Recs., H. Riedemann to McDonald, Nov. 16, 1900; L. Roe, Jr., to McDonald, June 24, 1902; Ackermann to DAPG, June 24, 1902; Asche to Pratt, Jan. 9, 1905; Donald to DAPG, Jan. 17, 1905; Teagle to Donald, Oct. 27, 1905; Klaare to E. C. Halsey, June 19, 1906; Bemis to DAPG, Mar. 19, 1908; H. Riedemann to Bemis, Mar. 30 (quotation), Apr. 21, 1908; Pitou memorandum, Aug. 14, 1911; H. Riedemann to Bemis, Oct. 7, 1911.

32. *Ibid.*, H. Riedemann to McDonald, Nov. 16, 1900 (quotation); H. Riedemann to Donald, Feb. 7, 1906, with account of Insurance Reserve Fund; H. Riedemann to Teagle, Aug. 28, 1911; H. Riedemann to Bemis, Oct. 7, 1911.

33. *Ibid.*, J. Bushnell to Rockefeller, Nov. 25, 1890, Mar. 22, 1893; Rockefeller to L. H. Severance, July 13, 1893.

34. *Ibid.*, Rockefeller to Folger, Feb. 19, 1909; *U.S.* v. *SONJ*, XXI, 90, Pet. Exhibit No. 941; Export Trade Recs., von Hartz to W. M. McGee, Mar. 6, 1905; SONJ, Consol. Accts. of S. O. Trust, 1882 to 1891, S. O. Interests, 1892 to 1899; L. D. Clarke to W. M. Hall, auditor in San Francisco of Standard Oil Co. (Iowa), Aug. 30, 1895; compare SONJ, "Report Standard Oil Co. of New Jersey, Depreciation: 1927 and subsequent years," and *Ind. Comm.*, I, 799.

In his letter in 1905 von Hartz, who had served as a bookkeeper in New York Standard, referred back to the policy of "liberal writing off" in prosperous years.

35. Export Trade Recs., memo, Donald to Brainard, May 16, 1905.

36. *Ibid.*, Tonio Riedemann to Donald, Dec. 7, 1904. DAPG's rates of depreciation at this time ranged from 2% on workers' dwellings to 25% on barrels.

37. Export Trade Recs., Donald to DAPG, Jan. 20, 1905.

38. SONJ, Salary Bk., 1903.

39. SONJ, L. D. Clarke to W. M. Hall, auditor, S. O. Co. (Cal.), Aug. 30, 1895; *Distribution of Expenses in Connection with the B. and M. Report and other Rules in relation to Home Office Accounting*, 4th edition (1904), 39, 51, 55 and 74.

40. Export Trade Recs., Brainard to Donald, Jan. 12, 1905; Asche to C. M. Pratt, Jan. 17, 1905; memo, Donald to Brainard, May 12, 1905. European practices differed fairly widely. For example, Anglo-American depreciated tank cars 6%, while all Continental affiliates used 10%.

41. Export Trade Recs., Brainard to Donald, Jan. 12, May 17, 1905; Asche to C. M. Pratt, Jan. 17, 1905, Jan. 22, 1906; Donald to Brainard, Mar. 28, 1905; Tonio Riedemann to Donald, June 29, 1907; Brainard to Bemis, Mar. 9, 1909; *Manual for Compiling B. & M. Report*, 39, 51, 55, and 74 (quotation).

42. Export Trade Recs., Brainard to Donald, Jan. 12, May 17, 1905; Asche to Pratt, Jan. 17, 1905; W. A. Hawkins to Brainard, May 17, June 6, 1905; H. Riedemann to Bemis, Oct. 7, Nov. 28, 1911; D. T. Warden to W. C. Teagle, Dec. 11, 1911; H. Riedemann to Foreign Sales Dept. of SONJ, Jan. 2, 1912.

43. SONJ, Consol. Accts. of SONJ, 1906-1911, supplement to earnings statements.

44. Rockefeller Recs., Rockefeller to Folger, Feb. 19, 1909; SONJ, Consol. Accts. of SONJ, 1906-1911, supplement to earnings statement.

45. SONJ, Consol. Accts. of SONJ, 1906-1911, and loose sheets attached thereto.

46. Export Trade Recs., A. H. Brainard to W. Donald, May 12, 1905.

47. Rockefeller Recs., J. D. Rockefeller to H. C. Folger, Jr., Feb. 19, 1909.

48. This section is written largely from a study of SONJ, Consol. Accts. of SONJ, 1899-1911, and other financial papers.

49. Where to put a company when classifying earnings often posed a ticklish problem. For example, Prairie Oil & Gas engaged only to a limited extent in pro-

ducing crude oil, most of its investment being in pipelines, storage tanks, and crude oil. Nevertheless, for most years its total earnings were entered with those of other "producing interests." The thinking behind that decision is unknown.

50. SONJ, C. T. White, "History of Standard Oil Company (New Jersey)," unpublished manuscript, list of largest stockholders of Standard Oil Company (New Jersey) who held more than 50% of the capital stock on Feb. 15, 1900, and Aug. 31, 1911; analysis of Stock Ledger showing the classification of stockholders as to number of men, women, and others from 1907 to 1936.

The number of stockholders at the end of 1910 was higher by 62 than a year later.

51. In conjunction with the distribution of the certificates of the Natural Gas Trust, $28,371.87 was paid to the certificate holders of the Standard Oil Trust. This cash amount is included in the calculation of the average dividends; the stock dividend was not.

52. The year 1907 showed the highest reported earnings; they were well over 100 per cent compared with capital stock and 29 per cent compared with net value. The picture for this single year was extreme, being distorted by the restoration in one year of several millions of dollars of depreciation.

No complete figures for sales of products in terms of volume or dollars are available for this period.

These figures for the price paid for Jersey Standard stock were found in a memorandum in SONJ; they differ from those found in other sources. The stock was not listed on the Stock Exchange. Pouch & Co., 18 Wall Street, in an undated circular apparently printed in 1908, gives the following figures:

High and Low Curb Market Quotations of Stock of Standard Oil Company (New Jersey)

	High	*Low*		*High*	*Low*
1897	362	295	1903	750	585
1898	445	340	1904	675	600
1899	498	428	1905	641	630
1900	825	470	1906	700	505
1901	842	650	1907	564	390
1902	720	612			

53. *Report of the Commissioner of Corporations on the Petroleum Industry.* Part II, *Prices and Profits,* 2.

54. Export Trade Recs., memo by W. H. L., Mar. 7, 1910.

55. Rockefeller Recs., J. D. Rockefeller to Folger, Feb. 19, 1909.

(Unfortunately the method of calculating this figure is not known, since Folger's analysis has not been found.)

56. *Ibid.,* Feb. 27, 1909.

57. *Ibid.,* May 3, 1909.

58. *Ibid.,* Feb. 27, 1909.

59. *Ibid.,* May 3, 1909.

60. *Ibid.,* Feb. 19, 1909.

On August 25, 1891, Folger wrote to Rockefeller stating that the Crude Oil Department, before arriving at its net loss on Lima oil, charged against its Profit and Loss account interest on its standing average balance at the rate of 3½%.

CHAPTER 22

1. The chief source for the first section of this chapter is the voluminous Elliott Recs., 1898-1911, *passim.*

2. Dodd Recs., 1902-1905, *passim;* John Brooks Leavitt, *Memorial of Samuel C. T. Dodd,* read before the Association of the Bar of the City of New York, Jan. 14, 1908, p. 13.

3. Dodd Recs., S. C. T. Dodd to C. M. Everest, Nov. 15, 1902.

4. Elliott Recs., 1898-1911, *passim,* especially Elliott to Geo. Shirts, May 5, 1898, and Elliott to Bailey, Sept. 18, 1906.

5. Dodd Recs., S. C. T. Dodd to O. K. Davis, Nov. 26, 1902; Elliott Recs., Elliott to J. A. Taylor, Dec. 29, 1902; Elliott to W. Rockefeller, Feb. 14, 1906; Elliott to F. E. Hurley, June 21, 1906; Elliott to W. P. Howe, Aug. 2, 1907.

6. Among the counsel of affiliates were Henry M. McSweeney, H. C. Dorworth, F. E. Hurley, J. B. F. Cates, W. J. Fitzpatrick, and Christy Payne.

7. Elliott Recs., R. W. Cummins to Elliott, May 22, 1902.

8. *Ibid.,* Elliott to Sayers, Nov. 13, 1901; Elliott to Christy Payne, June 23, 1904; Elliott to W. P. Howe, Aug. 2, 1907;

Elliott to J. I. C. Clarke, Dec. 30, 1907; Elliott to F. C. Layton, Jan. 17, 1902 (quotation).

9. *Ibid.*, Elliott to John Tonkin, June 29, 1898; Elliott to John Poe, Findlay, Ohio, Feb. 2, 1898; Elliott to C. N. Payne, Aug. 19, 1898; Elliott to R. W. Cummins, May 22, 1902; Elliott to A. H. Brainard, Oct. 21, 1910.

10. *Ibid.*, W. L. Crounse, manager of Washington News Service, to J. D. Archbold, Nov. 21, 1900.

11. SONJ, Salary Bks. and cards; J. I. C. Clarke, *My Life and Memories* (New York, 1925); *DAB*, IV, 157-158; Crum and Dungan, *Romance of American Petroleum & Gas*, I, 326-327.

12. H. D. Lloyd, *Wealth against Commonwealth* (Washington, D.C., National Home Library Foundation edition, 1936), 304.

13. In consecutive order, the quotations are found in *ibid.*, 336, 354, and 339.

14. *Standard Oil Trust Cases, Ohio, 1899, passim,* supplied the data for the discussion of the cases in Ohio.

15. Nevins, *Rockefeller,* II, 345-346; Elliott Recs., Elliott to L. T. Neal, Dec. 13, 1900.

16. *Ibid.*, Dec. 26, 1900-Jan. 26, 1901.

17. *John J. Carter* v. *Producers' Oil Company, Limited; National Transit Company and J. C. McDowell* v. *United States Pipe Line Co.;* Nevins, *Rockefeller,* II, 327-328. See Chapter 10 of this volume.

18. New York *Commercial Advertiser,* Feb. 21, 1898; Elliott Recs., H. C. Pierce to M. F. Elliott, Aug. 12, 1902, and enclosure; Elliott to V. P. Kline, Mar. 27, 1900; 177 U.S. 28.

19. The next two paragraphs are summaries of *Ind. Comm.*, I.

20. Dec. 7, 1897.

21. New York *World,* May 24, 1894.

22. *Ibid.*, July 25, 1897, repeated on Nov. 6, 1898.

23. *Ibid.*, Nov. 25, 1898.

24. *Ibid.*, May 16, 1897.

25. A. A. Berle in his review of *Mr. President* by William Hillman in the *New York Times Book Review,* Mar. 23, 1952.

26. Louis Filler, *Crusaders for American Liberalism* (New York, 1939, new edition, 1950), states on page 103 that "Ida Tarbell was objectivity itself." On the next page her work was characterized as "just and complete in its proportions" and her style as "calm, analytical, factual."

27. Tarbell, *History of the Standard Oil Company,* I, 49, 101.

28. *Ibid.*, II, 227.

29. G. H. Montague, "The Legend of the Standard Oil Co.," *The North American Review,* CLXXXI (Sept., 1905), 352.

30. *Loc. cit.*

31. "The Standard Oil Company," *The Nation,* LXXX, No. 2062 (Jan. 5, 1905), 15-16.

32. "Ida Tarbell's Tale of the Standard Oil," *Gunton's Magazine,* XXVI (1904), 95-107.

33. "A History of the Master-Trust," *The Arena,* XXXIV, No. 191 (Oct., 1905), 436 ff.

34. Ellery Sedgwick, "The Man with the Muck Rake," *American Magazine,* LXII (1906), 110 ff.

35. Filler, *op cit.*, 107. McClure, Phillips & Co. was bought by Doubleday, Page & Co. When asked for information on the number of the copies of the *History* printed, the current firm of Doubleday did not have the data. Peter Smith issued a photographic reprint of the *History* in 1950.

36. Esso Standard, Real Estate Recs., *passim.*

37. O'Day Recs., O. A. Evans to O'Day, Nov. 28, 1903.

38. *Ibid.*, O'Day to H. H. Rogers, Oct. 19, 1903; O'Day to J. D. Rockefeller, Dec. 16, 1904; O'Day to J. Bushnell, Jan. 30, 1903 (quotation).

39. *Ibid.*, J. A. Moffett to O'Day, Oct. 25, 1904; O'Day to Forrest M. Towl, Oct. 26, 1904.

40. Dodd Recs., S. C. T. Dodd to Howard Page, Oct. 29, 1902; O'Day Recs., E. Strong to O'Day, Jan. 15, 1903.

Strong reported that The East Ohio Gas Co. did not answer attacks of competitors in the newspapers. "It has always

been our policy to make no comments on the remarks made by the papers; it dies out quicker by making no answer."

41. Dodd Recs., S. C. T. Dodd to F. Q. Barstow, Jan. 14, 1903; *Ind. Comm.*, I, 559.

42. *Ibid.*, S. C. T. Dodd to Archbold, Oct. 3, 1903.

43. *Ibid.*, S. C. T. Dodd to Archbold, Oct. 5, 1903; Dodd to Boyle, Feb. 7, 1905.

44. Microfilms of Lloyd Papers from the Wisconsin Historical Society by courtesy of J. Blicksilver: the Rev. B. Fay Mills to the Rev. Edward Everett Hale, Apr. 21, 1896; Lloyd to ministers, Apr. 28, 1896; Sherman to Lloyd, May 4, 1896; Commons to Lloyd, May 18, 1896; Ely to Mills, Apr. 25, 1896.

45. Elliott Recs., Kline to Elliott, Mar. 3, Apr. 14, May 14, 1899; Elliott to J. O. Troup, Feb. 6, Mar. 9 (quotation), 1899.

46. *Ibid.*, Elliott to McSweeney, Mar. 21, 1899; Elliott and Kline to A. McDonald, Mar. 28, 1899; Elliott to L. P. Neal, Oct. 19, 1900; New York newspapers, Mar. 20 and 21, 1899.

47. *Ind. Comm.* I, 514, 516 and 530 (quotations in order), and *passim.*

48. *The Engineering Magazine* (later *Factory and Industrial Management*), XX (1901), 762.

49. Dodd Recs., Dodd to Rogers, June 2, 1903.

50. "A Symposium of Expert Opinion. Strength and Weakness of the Combination or Trust Idea," *The Engineering Magazine,* XX (1901), 761-764.

51. *Pure Oil Trust vs. Standard Oil Co.*, 3-4.

52. Among Dodd's writings were: S. C. T. Dodd, *Combinations: Their Uses and Abuses, with a History of the Standard Oil Trust* (New York, 1888); *Ind. Comm.*, I, 798-800; S. C. T. Dodd, "Shall All Business Co-operation be Rendered Criminal. . . ? A Statement of Pending Legislation and Its Consequences" (25-page pamphlet, n.p., n.d.); S. C. T. Dodd and Terence V. Powderly, "Trusts, Arguments Pro and Con," *The Tribune,* 1892, also published as a pamphlet in which Dodd had 18 pages on "A Defense of the Plan of Trusts;" S. C. T. Dodd, "The Present Legal Status of Trusts," *Harvard Law Review,* VII (Oct. 25, 1893), 157-169; S. C. T. Dodd, "Ten Years of the Standard Oil Trust," *The Forum,* XIII (May, 1892), 300-310; S. C. T. Dodd, "Syracuse University Lecture" (pamphlet, Feb. 13, 1893); S. C. T. Dodd, "The War against Wealth," *The Independent,* XLIX, No. 258 (Mar. 4, 1897), 267-268; S. C. T. Dodd, *Trusts* ([New York], 1900); S. C. T. Dodd, "Peculiar Legislation," *Counsellor,* II (April, 1893), 195-197; *Oil on Troubled Waters,* probably a collection of pamphlets, mentioned in John Brooks Leavitt, *Memorial of Samuel C. T. Dodd,* 12.

53. Dodd, *A Defense of the Plan of Trusts,* 7 and 16; Roger Sherman, "The Standard Oil Trust: The Gospel of Greed," *The Forum,* XIII (July, 1892), 602-615.

54. *Folger,* "Petroleum, Its Production and Products in Pennsylvania."

55. *The Independent,* LII, No. 2676 (Mar. 15, 1900), 645-647.

56. Elliott Recs., Elliott to Boyle, July 22, 1901; Boyle to Elliott, July 25, 29, 1901, Mar. 2, 1904; Elliott to O'Day, Nov. 30, 1904; O'Day Recs., O'Day to Seep, Dec. 1, 1904; Seep to O'Day, Dec. 3, 1904; *Ind. Comm.* I, 404, 487-488; Derrick's *Handbook,* I, 494.

57. SONJ, misc. papers on loans; O'Day Recs., Boyle to O'Day, Dec. 14, 1904; O'Day to Rogers, Dec. 29, 1904, Jan. 24, 1905; Derrick's *Handbook,* I, 461 and 465. Independent producers began publishing *The Daily Oil News* on Oct. 3, 1887, and the Pure Oil group started *The Petroleum Gazette* in the middle nineties.

58. *Gunton's Magazine* (early volumes called *The Social Economist*), 1891-1904, *passim,* especially I (Mar., 1891), 1 and 6 (quotation), IX (Nov., 1895), 240-248, and (June, 1897), 367-375; "Trusts and Business Stability," XX (Feb., 1901), 117-126; "Capital and Labor Conferences," XXII (Jan., 1902), 25 (quotation); "Industrial Peace," XXVII (Sept., 1904), 245-256.

59. Dodd Recs., S. C. T. Dodd to Fred Mohr, Jr., June 11, 1902; Dodd to C.

Gunton, Dec. 8, 1904; Dodd to Archbold, Jan. 6, 19 (quotation), 1904.

60. O'Day Recs., O'Day to Archbold, July 29, 1904; J. W. McMahon to O'Day, Aug. 18, 1904; O'Day to Rogers, Dec. 29, 1904; H. Apthorp to O'Day, Sept. 19, 1904, Feb. 4, 1905; Malcolm Jennings to Apthorp, Sept. 16, 1904; "Summary of Disbursements," H. Apthorp, Nov. 16, 1898, to Dec. 1, 1903; Elliott Recs., Apthorp to Kline, Nov. 10, 1906; Apthorp to Elliott, June 28, 1907; Deposition in *Standard Oil Trust Cases, Ohio, 1899*, 235-237 (George M. Cook) and 312-316 and 321 (Malcolm Jennings), Exhibit A.

The general nature of items inserted by the agency is indicated by an excerpt from the Lima *Times-Democrat*, which was given in Exhibit A at the time that the relation between Standard Oil and Jennings was aired in court:

> Whether the Standard Oil Company of Ohio is in trust or out of a trust is a question for the courts to decide, and whether the consumers of oil are getting a better quality at less cost, and handled with greater safety than formerly, is a question for the people to decide. In the commercial affairs of life it is things, not words, that count in making up the balance sheet of loss or gain, of benefit or injury. Monopoly and octopus, combines and trusts are haughty words, but the best goods at lower prices are beneficial things. It is much easier to say harsh words than it is to make things cheap.

An interesting side light on the relations with the Ohio press arose in 1907 as a result of Standard Oil's making arrangements with N. W. Ayer & Son, Philadelphia, to place advertisements of products for various companies in the group. To some Ohio papers whose editorial policy was unfriendly to the petroleum combination the Philadelphia company was paying a higher space rate than Jennings was paying to newspapers whose editorial policy was favorable.

61. O'Day Recs., O'Day to C. T. Sloan, Nov. 24, 1903; Dodd Recs., S. C. T. Dodd to Prosperity Publishing Co., May 5, 1903 (quotation); Dodd to Archbold, Sept. 10, 1903.

62. Elliott Recs., Elliott to Kline, Oct. 27, 1900.

63. For example, see *Brooklyn Eagle*, Oct. 3, 1897.

64. Dodd Recs., Dodd to John J. McLaurin, Oct. 2, 1902.

65. *Ibid.*, Dodd to Archbold, Oct. 23, 1903.

66. SONJ, Eames notebook; Elliott Recs., Elliott to Boyle, Oct. 3, 1902; Dodd Recs., S. C. T. Dodd to Rogers, Mar. 14, 1903; Dodd to Ida Tarbell, Jan. 4, 1904; O'Day Recs., Ida Tarbell to O'Day, May 7, 1903; O'Day to C. N. Payne, May 11, 13, 1903; O'Day to Ida Tarbell, June 25, 1903, Oct. 19, 1903.

67. O'Day Recs., C. N. Payne to O'Day, May 11, 1903.

68. *Ibid.*, O'Day to J. O'Brien, Apr. 26, 1906.

69. Export Trade Recs., Holm to Teagle, Mar. 4, 1905; Nevins, *Rockefeller*, II, 549.

70. Dodd Recs., S. C. T. Dodd to Montague, Oct. 7, 1902; Dodd to Archbold, Mar. 7, 1903; Dodd to Rogers, June 17, 1903, Jan. 7, 1904; Dodd to Harper & Bros., Jan. 25, 1904; G. H. Montague, "The Rise and Supremacy of the Standard Oil Company," *Quarterly Journal of Economics*, XVI (Feb., 1902), 265-292; G. H. Montague, "The Later History of the Standard Oil Company," *Quarterly Journal of Economics*, XVII, No. 2 (Feb., 1903), 293-325.

71. Nevins, *Rockefeller*, II, 505, indicates that Archbold was responsible for the increase in the political activities of Standard Oil employees.

72. Elliott Recs., Elliott to D. J. O'Day, Mar. 2, 1900.

73. *Ibid.*, R. W. Cummins to Elliott, Oct. 12, 1900; Mallison, *The Great Wildcatter*, 50-51.

74. *Ibid.*, 52. For examples of denials, see *Toledo Blade*, Oct. 27, 1896; *New York Tribune*, Oct. 31, 1896.

75. Elliott Recs., D. J. O'Day to Elliott, Apr. 26, May 3, 20, 1901.

76. O'Day Recs., M. A. Hanna to M. B. Daly, Sept. 26, 1903; M. B. Daly to M. A. Hanna, Sept. 28, 1903.

77. *Ibid.*, M. B. Daly to O'Day, Dec. 4, 1903.

78. *Ibid.*, J. W. McMahon to O'Day, Sept. 19, 1903.

79. Elliott Recs., Elliott to Graham, Apr. 9, 1900.

80. Dodd Recs., S. C. T. Dodd to Geo. S. Griswell, Mar. 16, 1903.

81. Elliott Recs., W. E. Rice to Elliott, Mar. 4, 1898.

82. Dodd Recs., S. C. T. Dodd to Geo. S. Griswell, Mar. 16, 1903; Dodd to Archbold, Apr. 20, 1903.

83. *Ibid.*, S. C. T. Dodd to Archbold, Jan. 28, 1903, Jan. 26, 1904; O'Day Recs., *passim*; Elliott Recs., *passim*; Dodd, "A Statement of Pending Legislation and Its Consequences."

84. *The Independent*, LXV (1908), *passim*; *Hearst's Magazine, The World To-Day*, XXI-XXII (1912), *passim*; J. B. Foraker, *Notes of a Busy Life*, 2 vols. (Cincinnati, 3rd edition, 1917), II, 328-354. For a fuller treatment of political activities than to be found in our book, see Nevins, *Rockefeller*, II, 505-515, and A. L. Moore, *John D. Archbold and the Early Development of Standard Oil* (undated Ph.D. dissertation, Columbia University), 234-259.

85. Elliott Recs., Elliott to T. A. Morrison, Oct. 28, 1908.

86. U.S. Senate, Committee on Privileges and Elections, *Campaign Contributions, Testimony before a Subcommittee of the Committee on Privileges and Elections, United States Senate, Sixty-second Congress, Third Session. . .*, 2 vols. (Washington, 1913), I and II, *passim*; Arthur H. Gleason, "Mr. Hearst's Thieves," *Collier's*, XLII, No. 5 (Oct. 24, 1908), 8-9; Arthur H. Gleason, "Mr. Hearst's Forgeries," *Collier's*, L, No. 3 (Oct. 5, 1912), 10, 11, 37.

87. Elliott Recs., Elliott to J. K. Jones, Aug. 31, 1912.

CHAPTER 23

1. The material for the first section of this chapter is drawn largely from the O'Day Recs. and the Elliott Recs.

The current periodical literature presented the story in various lights. See especially: "Kansas Rises against the Standard Oil," *Current Literature*, XXXVI, No. 4 (Apr., 1905), 292-294; "Battle of a Commonwealth against the Criminality, Rapacity, and Extortion of a Great Corporation," *The Arena*, XXXIII, No. 185 (Apr., 1905), 435-440; Ida Tarbell, "Kansas and the Standard Oil Company," Part I, *McClure's Magazine*, XXV, No. 5 (Sept., 1905), 469-481, and Part II, XXV, No. 6 (Oct., 1905), 608-622; I. F. Marcosson, "Kansas Oil Fight," *World's Work*, X, No. 1 (May, 1905), 6155-6166; F. S. Barde, "The Oil Fields and Pipe Lines of Kansas," *The Outlook*, LXXX (May 6, 1905), 19-32; John J. McLaurin, "The Oil Situation in Kansas," *The Outlook*, LXXX (June 17, 1905), 427-431. The editor announced that the last-named article was considered by the Standard Oil Co. to be a fair presentation of the facts.

2. O'Day Recs., O'Day to O'Brien, July 29, 1904; O'Brien to O'Day, Aug. 10, 1904, and clippings.

3. *Ibid.*, W. F. Gates to C. N. Payne, June 17, 1903; Archbold to O'Day, July 1, 1903; D. J. O'Day to O'Day, Jan. 12, 1904; O'Day to O'Brien, Oct. 26, 1904; O'Brien to O'Day, Oct. 17, Nov. 7, 19, 1904; C. N. Payne to O'Day, Jan. 6, 1905; Elliott Recs., O'Brien to Elliott, Mar. 3, 1905.

The producers had been irritated in 1903 at the introduction of a 3% deduction from their petroleum for B. S. & W. Each tank was tested for specific gravity. Oil above 32° Baumé received a given price; and for each half-degree below this a reduction of 5 cents was made down to 28° Baumé. For all below that, the price was 1 cent less.

4. O'Day Recs., D. J. O'Day to H. H. Rogers, June 25, 1904; memo on "The Relation of Stock Jobbing to Oil Production in the Kansas Field," March, 1905; D. J. O'Day to O'Day, Jan. 13, 1905.

In the latter letter, D. J. O'Day wrote of Ohio and Indiana: "The producers with whom I have talked seem to have some idea of the very large production of oil in the world, but the newspapers, in many cases, seem to consider only local conditions."

5. O'Day Recs., O'Day to P. Boyle, Aug. 5, 1904.

6. *Ibid.*, Michael Cudahy to O'Day, Apr. 3, 1905.

7. *Ibid.*, O'Day to J. O'Brien, Apr. 5, 1904; W. F. Gates to D. J. O'Day, July 31, 1904; J. O'Brien to O'Day, Aug. 10, 1904 (and newspaper clippings). Cf. *The Petroleum Gazette*, IX, No. 4 (July 1904), 1, and *Pittsburgh Dispatch*, July 31, 1904.

8. O'Day Recs., O'Day to Archbold, July 29, 1904; O'Day to J. G. Slonecker, Aug. 1, 1904; memo, Sept. 1, 1904; M. Jennings to H. Apthorp, Sept. 16, 1904; H. Apthorp to O'Day, Sept. 19, 1904, Feb. 4, 1905; Elliott Recs., Charles Curtis to Elliott, Mar. 27, 1905; Elliott to Curtis, Aug. 2, 1904, Mar. 29, 1905.

9. O'Day Recs., O'Brien to O'Day, Feb. 3, 1905; Elliott Recs., Worthington to Elliott, Mar. 15, 1905.

10. Elliott Recs., P. Boyle to Elliott, Mar. 9, 23, 26, 30, Apr. 6, 13, 1905; Elliott to Boyle, Mar. 16, 1905.

The newspaper campaign in Kansas was terminated when Garfield began his investigation.

11. O'Day Recs., O'Brien and J. W. McMahon to O'Day, Jan. 25, 1905; Elliott Recs., J. B. F. Cates to J. D. McFarland, Aug. 13, 1908; Philip Eastman, "The Kansas State Refinery Bill and Its Significance," *The Arena*, XXXIII, No. 186 (May, 1905), 500-505; C. M. Harger, "Kansas Battle for Its Oil Interests," *American Review of Reviews* (Apr., 1905), 471-474; Independence *Daily Reporter*, Dec. 22, 1904; *The Topeka Daily Call*, Feb. 14, 1905.

Eastman quotes Hoch: "Take that monster the Standard Oil Company by the throat and compel it to be decent."

One attorney aptly characterized Monnett's influence on the slant of the testimony in the Santa Fe cases. J. B. F. Cates wrote that Monnett "was very ingenious in propounding such questions and suggesting the answers thereto as would be most prejudicial to The Prairie Oil & Gas Co. In fact, the rules of evidence were wholly disregarded, and all that was required was some fellow to express an unfriendly opinion to The Prairie Oil & Gas Company."

The case against Kansas Standard instituted in March, 1905, was withdrawn, but another was started in 1906.

12. SONJ, Philip P. Campbell to E. F. Johnson, Jan. 31, 1939; Elliott Recs., R. W. Cummins to Elliott, Mar. 23, 1905; O'Day Recs., W. F. Gates to D. J. O'Day, Apr. 26, 1905. Gates wrote: "I am sure a large percentage, if not all, of the producers of the field realize that a great mistake has been made in the attitude, taken by the ring leaders of the agitation."

Campbell was not employed by Standard Oil Co. (N. J.) until after his retirement from Congress in 1923.

13. O'Day Recs., David J. Kelley, pres. and gen. mgr. of the Lima Oil Co., to O'Day, June 9, 1905, and undated enclosed newspaper clipping of letter, D. J. Kelley to editor of the *Oil City Derrick*, May 27, 1905.

14. O'Day Recs., W. J. Young to C. A. Braley, Apr. 1, 1905; W. F. Gates to D. J. O'Day, Apr. 26, 1905; O'Neill to J. Bushnell, Mar. 1, 1906; Elliott to Earle Evans, Aug. 18, 1906.

O'Neill was later invited to attend a meeting of Kansas producers in order to explain why the work on pipelines was postponed. In the summer of 1906 Prairie Oil & Gas expressed willingness to cooperate in cutting down production or to suspend its own production entirely for a time.

15. *Report of the Commissioner of Corporations on the Transportation of Petroleum*, May 2, 1906 (Washington, D.C., 1906), James R. Garfield's letter of submittal, xix. Hereinafter this will be cited as Garfield Report.

16. Nevins, *Rockefeller*, II, 516.

17. O'Day Recs., J. J. Griffin to W. F. Gates, Apr. 16, 1905.

18. "Reply by the Standard Oil Company," *Oil, Paint & Drug Reporter*, LXIX, No. 19 (May 7, 1906), 28H.

19. *Loc. cit.*

20. *New York Evening Sun*, May 17, 1906; *New York Tribune*, May 19, 1906.

21. *Testimony of Standard Oil Representatives before the Department of Commerce and Labor* (Washington, D.C., 1906).

22. This point was cogently made by G. H. Montague in the *Boston Evening Transcript,* Nov. 10, 1906.

23. Garfield Report, 211-212.

24. This generalization is based upon a perusal of an extensive collection of newspaper clippings of SONJ covering the months under review.

It should be observed that all the enumerated litigation was exclusive of the numerous leasing, damage, and other cases normally incidental to a nationwide petroleum business.

25. On the briefs for the federal government were J. Harwood Graves, Cordenio A. Severance, and Guy Chase; for Standard Oil, Frank L. Crawford, Chauncey M. Martyn, Douglas Campbell, Walter F. Taylor, John M. Freeman, Ernest C. Irwin, and W. I. Lewis. Taylor's task was to compile a legal and corporate history of the Standard Oil combination which has survived and has served the authors of this volume exceedingly well. Martyn aided in the examination of witnesses at Chicago and St. Louis.

26. The seven companies that went into the Natural Gas Trust were The Buffalo Natural Gas Fuel Co., Commercial Natural Gas Co., National Fuel Gas Co., The Oil City Fuel Supply Co., Pennsylvania Gas Co., Salamanca Gas Co., and United Natural Gas Co. The nine gas companies named which were still in the combination in 1906 were The Connecting Gas Co., The East Ohio Gas Co., Lawrence Natural Gas Co., The Mahoning Gas Fuel Co., The Mountain State Gas Co., North Western Ohio Natural Gas Co., The Peoples Natural Gas Co., Pittsburgh Natural Gas Co., and Taylorstown Natural Gas Co.

27. Copies of the exceptions submitted by SONJ lawyers; Kellogg Papers, Minnesota Historical Society, Kellogg to Wade Ellis, Attorney General of Ohio, Dec. 17, 1906. "Of course, I relied on the Department of Commerce & Labor for the information. They claimed to have inspected all the articles of incorporation," Kellogg wrote.

28. These answers omitted the names of the gas companies, eight dead companies, the Folger-Payne partnership, and the companies in which Standard Oil held a minority interest.

29. U.S. Interstate Commerce Commission, *Report of Investigation of Railroad Discriminations and Monopolies of Oil,* Jan. 28, 1907, H. Doc. No. 606, 59th Cong., 2d sess.

30. *Report of the Commissioner of Corporations on the Petroleum Industry.* Part I, *Position of the Standard Oil Company in the Pet. Ind.*, letter of submittal, xxi.

31. *Ibid.,* 8-18.

32. *Ibid.,* 22.

33. Various newspaper reports, May 25, 1907.

34. *State* v. *Waters-Pierce Oil Co.*, District Court of Travis Co., Texas.

35. *U.S.* v. *Standard Oil Co.* (*Ind.*), 155 Fed. Rep. 305.

36. *Report of the Commissioner of Corporations on the Pet. Ind.,* Part II, *Prices and Profits,* letter of submittal and summary.

37. Issue of Aug. 21, 1907.

38. Unless otherwise noted, the subsequent presentation of evidence for the defense is a summary of the testimony and exhibits in the first 21 volumes of the printed record in the case.

39. *Brief for Defendants on the Facts* (New York, n.d.), 611.

40. *Ibid.*, 699.

41. *Ibid.,* 514-516.

42. Elliott Recs., *passim*; *U.S.* v. *SONJ,* Testimony, XVII, 3555-3597, and XIX (Defendants' Exhibits Nos. 294-300), 696-700. The principal exhibits for the prosecution on prices may be seen in *ibid.,* VIII (Nos. 379, 380, and 382), 905-910; X (Nos. 628, 629), 1624; and XXI (Nos. 980-983), 140-142.

Jersey Standard managers and counsel considered calling upon E. R. A. Seligman to testify upon prices, but they decided that Johnson had displayed more understanding of Big Business than the Columbia professor.

43. 91 S. W. Rep., 1062-1075; Elliott Recs., 1909, *passim*; *New York Tribune,* Dec. 24, 1908, Feb. 2, 1909; *The New York Times,* Feb. 2, 1909; *Kansas City*

Journal, Feb. 15, 1909; Buffalo *Express*, Feb. 25, 1909; "Standard Oil in Missouri and Texas," *The Outlook*, XCI (Feb. 13, 1909), 320-322.

The court held that the three companies had been controlled by Jersey Standard, had deceived the public about that relation and about the nature of their competition, had conspired to regulate and fix prices at retail, and had controlled and restricted trade. Waters-Pierce was allowed to do business in the state if it took steps to prove that it was independently run by Jan. 18, 1909. Each was fined $50,000, and both Indiana Standard and Republic were ousted from the state. Actually, the latter had filed notice of its withdrawal in June, 1907.

44. *Waters-Pierce Oil Co.* v. *State of Texas*, 212 U.S. 86.

45. *State* v. *Security Oil Co., Navarro Refining Co., and Union Tank Line Co.*, District Court of Travis County.

46. *State (of Texas)* v. *Magnolia Petroleum Co., Standard Oil Co. (N. J.), and others.* See *The New York Times*, July 22, 1913.

47. Elliott Recs., 1908-1909, *passim.*

48. *State* ex. rel. *Cates, Attorney General* v. *Standard Oil Co. (Kentucky)*, 110 S. W. Reporter, 565; 217 U.S. 413.

49. 170 Fed. Rep., 988.

50. Kellogg Papers, Kellogg to C. A. Severance, Nov. 8, 1909.

51. Dudley Pendleton, "Current Beginnings of P. R.," *Public Relations Journal of the Public Relations Society of America*, VIII, No. 4 (Apr., 1952), 8-10, 14.

52. Rockefeller Recs., J. D. Rockefeller to H. C. Folger, Jr., Apr. 27, 1909; SONJ, books of newspaper clippings, *passim.*

53. J. D. Archbold to the Press and Public, Sept. 26, 1907, *The New York Times*, Sept. 27, 1907.

54. "The Standard Oil Company and Its Foreign Trade, An Important Letter by Mr. W. H. Libby," *The Petroleum Review*, XII, No. 319 (Apr. 15, 1905), 281-282, and XV, No. 381 (Sept. 15, 1906), 155; *Oil, Paint & Drug Reporter*, LXXVIII, No. 15 (Oct. 10, 1910), 28D.

Libby contended that if fair comparisons of prices were made, "the average cost to the foreign consumer is fully up to that of the home consumer."

55. *The New York Times*, Nov. 3, 1906.

56. *Ibid.*, May 2, 1907.

57. Elliott Recs., Elliott to H. M. Tilford, Apr. 6, 1909.

58. *The Outlook*, LXXXIV (Dec. 15, 1906), 943-944; Elliott Recs., H. C. Folger, Jr., to Elliott, Apr. 13, May 17, 1909.

59. Archbold Recs., E. B. Putnam to Archbold, Dec. 11, 1907.

60. Elliott Recs., E. Prizer to Elliott, Jan. 19, 1911, and enclosures; Memorandum of Facts in Matter of Buffalo Lubricating Oil Co.; *The Great Oil Octopus by "Truth's" Investigator* (London, 1911), reprint of articles.

61. Rockefeller Recs., H. H. Rogers to Rockefeller, Apr. 5, 1906.

62. "The Standard Oil Company," *The Saturday Evening Post*, CLXXX, No. 23 (Dec. 7, 1907), 3-5; *The South African Trade Journal and Shipping Gazette*, Feb., 1908; J. D. Archbold, "Petroleum: A Great American Industry," *The Independent*, LXIV, No. 3092 (Mar. 5, 1908), 511-513; Archbold Recs., quotations in order—D. J. Kelley to Archbold, n.d.; J. P. Jaeckel to Archbold, n.d.; Steven J. Murphy to Archbold, Dec. 6, 1907.

63. Rockefeller Recs., Rockefeller to F. Q. Barstow, Apr. 3, 24, May 4 (quotation), 1907; Bacon, *History of the South Improvement Company*, 3-41, including copies of documents.

64. Rockefeller Recs., Rockefeller to Starr Murphy, Rockefeller's personal counsel, Apr. 13, 1905.

65. *Ibid.*, Rockefeller to Starr Murphy, Apr. 1, 17, 1905, June 26, July 3, 7, 1908, Mar. 5, 11, 1909; Rockefeller to Mrs. H. McCormick, June 11, 1908 (quotation); Rockefeller to Archbold, June 26, Sept. 5, 1908; John D. Rockefeller, *Random Reminiscences of Men and Events* (Garden City, N. Y., 1909, reprinted, 1937); Starr J. Murphy, "A Reply to Dr. Gladden," *The Independent*, LVIII, No. 2946 (May 18, 1905), 1097-1099; "A Rejoinder from the Standard Oil Company, A Statement Issued Apr. 6

by Mr. S. C. T. Dodd, Chief Counselor of the Company," *The Congregationalist and Christian World*, Apr. 15, 1905.

After Ida Tarbell's articles of 1905, Rockefeller thought of asking for a retraction from *McClure's Magazine* for some of the inaccuracies. He even considered a libel suit. Starr Murphy and Dodd answered Washington Gladden. Both Starr Murphy and employees of the Standard Oil Co. went over Rockefeller's manuscript.

66. Rockefeller Recs., Rockefeller to N. G. W. Gardner, Oct. 5, 1908.

67. *Ibid.*, Rockefeller to Archbold, July 29, Aug. 18, 1905, July 26 (quotation), 1907; Rockefeller to Harold McCormick, Aug. 24, 1909; Ida Tarbell, "John D. Rockefeller," *McClure's Magazine*, XXV, No. 4 (Aug., 1905), 386-387.

68. Among the articles critical of Standard Oil during these years were the following: Thomas Lawson, "Frenzied Finance, The Story of the Amalgamated," *Everybody's Magazine*, XI, No. 2 (Aug., 1904), 154-164, and subsequent months; Ida M. Tarbell, "John D. Rockefeller," *McClure's Magazine*, XXV, No. 3 (July, 1905), 227-249, and No. 4 (Aug., 1905), 386-398; Ida Tarbell, "Roosevelt *vs.* Rockefeller," *The American Magazine*, LXV, No. 2 (Dec., 1907), 115-131, No. 3 (Jan., 1908), 267-281, and No. 4 (Feb., 1908), 425-434; Theodore W. Lincoln, "Reply to Archbold's Plea for Mercy," *Government*, II, No. 4 (Jan., 1908), 217-233; "Popular Rule or Standard Oil Supremacy: Which Shall It Be?" *The Arena*, XXXIX, No. 220 (Mar., 1908), 335-343; "The Beef and the Oil Trusts," *The Independent*, LVIII, No. 2935 (Mar. 2, 1905), 507-508.

69. *The Nation*, LXXXV, No. 2197 (Aug. 8, 1907), 112-113.

70. John Christopher O'Day, *Oil Wells in the Woods* (Oquaga Press, 1905), 289 and *passim*.

71. O'Day Recs., C. N. Payne to O'Day, Apr. 27, 1904.

Following a conviction of a man for larceny of oil from the National Transit Co. by jury trial at Franklin, Pennsylvania, Payne wrote: "This, I believe, is the first conviction of stealing oil from the pipe line that we have ever had and will be a great safeguard for the future."

72. G. Frederick Wright, "The Ethics of Standard Oil," *Bibliotheca Sacra*, LXII (July, 1905), 538-559.

73. Bernard de Voto, editor, *Mark Twain in Eruption* (New York, 1940), 96 ff.; F. N. Doubleday, "Some Impressions of John D. Rockefeller," *The World's Work*, XVI, No. 5 (Sept., 1908), 10703-10715; *New York Times*, Oct. 20, 1907; *New York American*, Jan. 12, 1906.

74. Herbert N. Casson, "The Master Builder of Standard Oil," *Broadway Magazine*, n.d., about 1907, in Dodd's personal clipping collection (quotations); "The Master Builder of Standard Oil: Samuel C. T. Dodd," *The American Review of Reviews*, XXXVII (Mar., 1908), 355-357; Leavitt, *Memorial of Samuel C. T. Dodd*. Some of the facts for these articles probably came from *Memoirs of S. C. T. Dodd Written for His Children and Friends, 1837-1907* (New York, 1907).

75. Howland, "Standard Oil," 157-176; H. J. Howland, "Standard Oil," *Valkyrian* (Jan., 1908); Elbert Hubbard, *The Standard Oil Company* (East Aurora, N. Y., 1910, reprint from *The Era*, a magazine); Day, *The Raid on Prosperity*; C. M. Keys, "The Standard Oil Company," *The World's Work*, XVI, No. 4 (Aug., 1908), 10571-10590; "How the Standard Oil Company Does Its Business," *The World's Work*, XVI, No. 5 (Sept., 1908), 10683-10702.

76. Anna Youngman, "The Tendency of Modern Combination," *The Journal of Political Economy*, XV, No. 4 (Apr., 1907), 193-208, especially 196 and 203. Cf. John Moody and G. K. Turner, "The Masters of Capital in America, The Standard Oil Company, Bankers," *McClure's Magazine*, XXXVI, No. 5 (Mar., 1911), 569.

The writers in *McClure's* characterized the combination as constituting "a huge secret bank, an instrument in the hands of a little council of silent men, which could at any moment concentrate a larger amount of ready money, in a short time, for a given purpose, than any other financial agency on earth could be relied upon to do." They pointed out that the

company had large cash assets not subject to bank examination. Its stock was not listed on the New York Stock Exchange, and hence it did not have to give information even to that private institution.

77. "A Chapter in High Finance," *The Nation*, LXXXVIII, No. 2291 (May 27, 1909), 545-546; *New York Evening Post*, Nov. 9, 1907.

78. *The Petroleum Review*, XIII, No. 354 (Dec. 16, 1905), 486.

79. *Ibid., passim*, esp. XII, No. 314 (Mar. 11, 1905), 186; XV, No. 380 (Sept. 1, 1906), 133-134; and XXI, No. 458 (Aug. 28, 1909), 123-124.

80. *Ibid.*, XII, No. 319 (Apr. 15, 1905), 286 (quotation); XIV, No. 371 (Apr. 28, 1906), 301-302; XV, No. 378 (Aug. 4, 1906), 69-70, and No. 380 (Sept. 1, 1906), 133-134.

81. *Ibid.*, XV, No. 380 (Sept. 1, 1906), 133-134; XVI, No. 400 (June 8, 1907), 309-310 (quotation); and XIX, No. 438 (Nov. 21, 1908), 279-280.

82. *Ibid.*, XIII, No. 350 (Nov. 18, 1905), 408; SONJ, copy of cable from F. Lane to J. H. Usmar, on or about Aug. 10, 1907, but referring to this earlier event.

83. Export Trade Recs., W. E. Bemis to J. I. C. Clarke, Dec. 15, 1909; H. Riedemann to W. E. Bemis, Nov. 29, 1909; W. C. Teagle to W. H. Libby, Apr. 4, 1911; Libby to Teagle, Apr. 10, 1911; Libby to Sec. of State, Apr. 24, 1911; *New-Yorker Handels-Zeitung*, Mar. 18, July 13, 1911.

84. Ambrose Pare Winston, "Public Opinion and the Standard Oil Company," *The Bulletin of the Washington University Association*, Apr., 1908, offprint.

85. *Ibid.*, 47 and 10, quotations in order.

86. Based on study of the voluminous newspaper clippings, 1906-1911, in Jersey Standard vaults.

87. Elliott Recs., Elliott to A. D. Eddy, Jan. 27, 1911.

88. Convenient summaries of the briefs and arguments may be seen in the *Oil, Paint & Drug Reporter*, LXXVII, No. 11 (Mar. 14, 1910), 29, and No. 12 (Mar. 21, 1910), 16; *The Outlook*, XCIV (Mar. 26, 1910), 645-647.

89. In a dissenting opinion Justice Harlan insisted that it was unwise to make a distinction between reasonable and unreasonable restraint of trade.

90. Eighteenth Biennial Report of the Attorney General of Kansas (1911-1912), 64-91.

91. The analysis of the distributive procedure is based upon Elliott Recs., May-Dec., 1911, *passim*, and blank forms used in the transfer of stock.

92. Another problem which worried Elliott and Standard Oil executives was that small holders would suffer. Owners of five shares or fewer of Jersey Standard stock received less than one share of stock in all separated companies except Buckeye Pipe Line, National Transit, Ohio Oil, and Anglo-American. Owners of fractional shares could not receive dividends or vote, both of which were distinct hardships. The difficulty was solved in large part by the appearance, during the summer and fall of 1911, of brokers specializing in Standard Oil stocks of all types. Prices remained remunerative, and the majority of the fractions were soon consolidated into shares enjoying full rights.

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